









ADULTERATION OF FOOD PRODUCTS.

FEBRUARY 28, 1900.—Ordered to be printed.

Mr. MASON, from the Committee on Manufactures, submitted the following

R E P O R T.

[To accompany S. Res. 447, Fifty-fifth Congress.]

Under the following resolution:

Whereas it is and has been for years publicly charged that in the manufacture of articles of food and drink many manufacturers of the United States, who transport their goods from one State to another, do most grossly adulterate such products, to the serious detriment of the public health and to the defrauding of purchasers: Therefore,

Resolved, That the Committee on Manufactures of the Senate is hereby authorized and directed to investigate and ascertain what, if any, manufacturers are adulterating food and drink products, and which, if any, of said products are frauds upon the purchasers.

Your committee beg leave to report that after the passage of said resolution they began taking evidence under the same, and have proceeded from time to time in different cities of the United States, which evidence has been duly reported and printed for the use of the Senate.

The committee can not emphasize too strongly the importance of this investigation and proposed legislation. The adulteration of prepared or manufactured foods is very extensively practiced and in many cases to the great discredit of our manufacturers. It is only fair to say, however, that a large proportion of the American manufacturers who are engaged in adulterating food products do so in order to meet competition, and it is the expression of those gentlemen to say, "We would be glad to get out of the business of adulterating. We would like to quit putting this stuff in coffee, and would be willing to brand our sirups for what they are, but our competitors get a trade advantage which we can not surrender."

It is the purpose of this committee to adopt this uniform rule: To prohibit the sale of deleterious and unhealthy food products, and as to those food products which are simply cheapened by adulterants, to compel the marking of those goods for what they are. An examination of the resolution shows that these are the two objects to be sought: To ascertain what food products are dangerous to public health, and, second, what products are sold in fraud to the consumer. The committee has adopted the rule above stated, for the reason that it feels

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that deleterious food products should be prohibited and the rest thoroughly regulated.

There have been two general ways suggested as to the matter of regulation. First, to put the important food products under the internal-revenue law, as we have in the case of butter, filled cheese, and, at the last Congress, flour. This committee recommended to the Congress in its last session the passage of the pure-flour bill, which was adopted. It was made ostensibly a revenue bill, which brought it within the decision of the Supreme Court of the United States, although as a revenue producer it will not be regarded as a great success. But it is a fact that it has absolutely prohibited the sale of adulterated flour, which was found to be in many cases dangerous to public health, and a further important fact that it increased the sale of American flour probably 25 per cent in other countries, and for proof of this we most earnestly beg attention to the letters, pages 8 to 11, printed in the evidence of the first witness, from the leading cities of the world, which show the increased demand for American flour as soon as Congress compelled that it should be sold for what it was. So it will be observed that if the rule established by this committee can be carried out as to our food products we will not only protect the consumer and the honest manufacturer who is willing to sell his goods for what they are, but we will also establish a reputation for our food products which will assist us to find a ready market for them in other countries.

The other plan to regulate the food products does not put it at all in the Internal-Revenue Department, but is contained in Senate bill 2426, which establishes a department under the Secretary of Agriculture, and provides for the establishment of a board which shall carry out the part of the rule established by this committee and fix the standards for foods, drinks, and for drugs based on the American Pharmacopœia. The strong argument in favor of this plan is the fact that it would be cumbersome to take all the small articles of food products that are now adulterated and allow their sophistication or adulteration for the purposes of cheapening, and require a stamp upon each of the small packages offered for sale.

To illustrate: The evidence before the committee shows that all our peppers, cinnamon, cloves, and spices generally, including ginger and mustard, are adulterated. One manufacturer testified that "he adulterated these largely with cocoanut shells, and that the amount of adulterants put in depended upon the man who ordered it. Sometimes as high as 60 per cent was put in." It would be difficult, it may be seen at a glance, to establish a law for spices, to compel them to stamp as mixed spice every package sold. It may be that such cumbersome legislation will have to be made in order to properly punish those who adulterate their goods; but it is hoped that Senate bill 2426 will reach all interstate traffic in manufactured food products, and that the board established under the bill will have power to fix standards based upon what is now the standard in the American Pharmacopœia.

In the case of butter, cheese, and flour the frauds practiced were so apparent and dealt so with the most important food products that the revenue plan seemed to be, and is, wise and successful, and it may become necessary, if the real purpose of this bill meets with opposition and defeat, wise and prudent for this committee to have prepared

and ready revenue legislation to reach some of the most glaring evils by adding it to the next revenue bill.

In the prosecution of this investigation we have had many difficulties to overcome, and the committee feels that in many cases they have not been able to secure the absolute truth. The committee feels under great obligation to Secretary Wilson, of the Agricultural Department, who has rendered us all service within his power and who has a deep and substantial interest in the public welfare in the matter of the adulteration of food products. The committee feels a special debt to the Secretary on account of the services of Dr. H. W. Wiley, the chief chemist of the Agricultural Department. Dr. Wiley has made more experiments upon these subjects and has probably analyzed more food products than any other chemist of our country, and a careful reading of his evidence will convince the reader of his marked ability and unselfish enthusiasm in the cause of pure food, and if the reader will go further and see the horrible stuff that is sold to the poor people, who must buy the cheapest food products, the poisons that go, in some neighborhoods, into the so-called "soda-water" glasses, the cheap poisonous stuffs that are sold for fruit jams and jellies in the poor quarters, and the thousand frauds practiced in the sale of foods upon the ignorant, poor, and sick and upon the children of the country the committee feels that the reader will join, in some degree at least, in the enthusiasm of Dr. Wiley.

Take, for example,

CONDENSED MILK.

The evidence taken before the committee conclusively shows that the great condensed milk factories of this country furnish a pure and healthful food product. A statement was made by a witness that skimmed milk was sold in that way. The committee has visited some of the great factories and observed the process, simple, clean, and healthful, and the great bulk of the condensed milk of the country is a perfect human food. A general manager of one of the largest concerns in the country explained fully his process, and testified further that he had personal knowledge of the way his competitors condensed their milk, and he testified that they all used practically the same process. Yet the fact remains that the gentlemen owning the great condensing factories are obliged to spend a large share of their time preventing the sale of adulterated condensed milk. This they are obliged to do in defense of their own trade, and this is, in our opinion, what the Congress of the United States ought to do to defend the honest manufacturer and the consumer.

SUGAR.

The committee has analyzed different samples of sugars bought in different cities, and have examined the chemists and manufacturers in the large factories owned by the sugar trust. The analysis agrees with the evidence of the manufacturers, and at the present time sugar made in this country is, in the opinion of the committee, free from adulterants. The bill which we recommend, however, will enable the Department to fix a standard for sugar which must be reached and will

be useful in the future to keep the present standard of sugar, if the temptation of high sugar and cheap adulterants should change the present standard.

SIRUPS.

The evidence given before the committee by the manufacturers of sirup is entirely verified by the analysis. Most of the sirup makers expressed their willingness to brand their sirup for what it is, providing their competitors will do the same. The committee has had before it scores of samples, and in almost no case was the sirup marked for what it really was. We have had as high as four grades of maple sirup, all branded "Maple Sirup" and containing all the way from 20 to 80 per cent of glucose. The evidence is clear that glucose is a healthy product, and when properly made, the experts testified, "is as healthy as cane sugar." It is also used in the adulteration of

HONEY.

The committee has had samples of jars of honey holding 2 quarts of what was marked "Honey," with about one ounce of floating honey comb on the top of the jar, and the rest glucose. The purpose of the committee is that the consumer, paying for honey, should receive it, and that the honest manufacturer of honey, who sells his goods for what they are, should not be compelled to compete with artificial goods sold for real.

EXTRACTS.

One of the difficulties the committee has to contend with is to get manufacturers to disclose fully to the committee the ingredients of their goods. The evidence of Dr. Wiley and other chemists shows the great frauds practiced in the manufacture of extracts. The committee has been taking evidence nearly a year, and the principal owner of an extract company in Chicago, Ill., is the only representative of extracts that has invited the committee and its chemists "to go through his factory from top to bottom," that they might see and know every article used by him in making extracts. The committee preferred to adopt the same rule, by buying samples in the open market, and the evidence of Dr. Wiley shows that his goods are genuine and what they pretend to be. The committee would not mention this specific fact except from a sense of justice, and also to call attention to the evidence as relates to extracts generally and the great and growing need of having a given standard. If the reader will take time to examine the evidence of Dr. Wiley and a dozen other practical chemists, and see the substances that are used for fruit and vanilla extracts, the necessity for the pending legislation will be most apparent.

BAKING POWDER.

In view of the very general use of baking powder in the household economy and its consequent importance, entering as it does into the daily diet of young and old, the vigorous and enfeebled, of all classes and conditions of society, your committee approached the investigation of the subject with a great deal of care, determined, if possible,

to gather such facts as would justify it in arriving at a conclusion that would satisfy the public mind and settle at once and forever whether fruit acid from the grape or mineral acid from alum was the proper constituent of a baking powder. In this your committee believes it has fully succeeded.

Attached to this report will be found the testimony of eminent scientific men, chemists, physiologists, and doctors of medicine, gentlemen of the very highest standing in their several professions, overwhelmingly condemnatory of the use of alum in the manufacture of baking powder and recommending that it be prohibited by law.

This testimony is of a character that must command the confidence and respect of those whose aim and object it is to get at the truth and who seek to promote the public welfare by conserving the public health.

While your committee recognizes the existence of a general repugnance to what is termed sumptuary legislation, and while it still further recognizes the consideration due to private rights as represented by the capital invested in the manufacture of alum baking powders, yet it conceives there is still a higher duty due from the State to its citizens in protecting them against an article or articles distinctly deleterious to the public health. It was with this ultimate object in view that your committee was authorized to make the searching investigation in which it has been engaged for the past twelve months, and covering a wide range of subjects, and it would feel that its time was worse than wasted if it were not prepared to make specific recommendations based upon the evidence which it has taken, where such evidence is conclusive. Therefore, so far as the use of alum in the manufacture of a food product, such as baking powder, is concerned, the committee, in view of the overwhelming mass of evidence antagonistic to its use, recommends that its use in food products and baking powders be prohibited by law.

BEERS, ALES, AND PORTERS.

One of the most important subjects under consideration has been that of the great American brewing industry. The committee has, through its agents, visited 92 breweries in 19 cities and purchased nearly 400 samples of their products in open market, and, under the evidence of the Government analytical chemists who analyzed said samples, we find but 2 samples of American beer, ale, and porter containing preservatives.

While the imported beers do not rank as high as American beers, a much larger per cent of the imported beer samples analyzed were found to contain preservatives.

Two very important questions present themselves to the committee in consideration of beers.

First, as to whether there be a national standard fixed for beers, fixing the minimum amount of malt extract to be contained in the beer product.

Second, whether we should adopt in this country the law which prevails in some parts of the German Empire, which provides that beer should be made of barley, malt, and hops exclusively, or whether the American brewer should be permitted to use in conjunction with malt and hops other cereals, such as corn and rice.

The present methods pursued by the American brewer are the same as contained in the English law, governing their brewing industries. As a rule, the American brewers make many different kinds of beer in the same brewery. The American taste for beer varies from that of other countries and the tastes in locality also vary. Some require a light beer, as more pleasant to the eye as well as taste, while others desire a much darker grade of beer.

When the American brewer uses other cereals than barley, they are used in an unmalted state—that is, corn or rice—which gives a lighter color to the beer. It has been charged in a general, unsubstantiated way, by either a witness or through a communication, that these cereals did not produce as healthy a beer as an all-malt beer. But the overwhelming and almost uncontradicted evidence is that the use of corn or rice, for the purposes as stated, is not in the least deleterious to public health, and while the practical brewer, maltsters, chemists, and analytical experts, as well as medical experts, approve the use of the unmalted cereals for the purposes as stated, whenever interrogated on that point, no witness has stated before this committee why the use of corn or rice unmalted, or other unmalted cereals, ought not to be used as it is all over the world.

Mr. Gladstone, speaking in the English Parliament upon this question, said:

The brewer will brew from what he pleases, and will have a perfect choice of his material and of his methods. I am of the opinion that it is of enormous advantage to the community to liberate an industry so large as this with regard to the choice of those materials.

The British parliamentary commission investigated this subject for four years, and the following is taken from their report, sustaining the bill, which was passed upon the motion of Mr. Gladstone years before, which gave the free malting privileges to the brewer:

It can not be admitted that the liquor made from malt, hops, yeast, and water, only, has an exclusive right to the name of beer, or that the purchaser who demands beer demands an all-malt liquor. Sugar was intermittently permitted to be used in beer a century ago; for over fifty years its use has been continuously permitted by acts of Parliament, and eighteen years ago complete freedom in the use of all wholesome materials was deliberately granted to brewers by Parliament.

We also call attention to the following, taken from the English report:

The question as to the relative merits of different brewing materials can not be unconditionally settled with the data at present available, but the balance of experience and authority inclines to the view that while an all-malt brewing from a blend of malt made from the best English and foreign barley is still the best for some descriptions of beer (pale bitter ale, for example), yet, for other descriptions, which constitute by far the larger proportion of the beer consumed, the medium or lower qualities of British barley malt (and our barley malt is not any better; that is, the average barley malt) are used. The medium or lower qualities of British barley malt are improved as brewing materials by the addition of a moderate proportion of good brewing sugar, and this is especially the case when the barley from which the malt is made has been imperfectly ripened or harvested under unfavorable conditions.

The committee, then, is of the opinion that the present system in America is fairest and more nearly just to the manufacturer and consumer to permit the brewer to be the judge himself of what wholesome and healthy products he desires to put into his beer; and the bill, which we will finally present to Congress, will prevent the use of any unwholesome preservatives or deleterious substances.

Much public concern has been excited because it has been charged that the American brewer uses a large amount of salicylic or other acids to preserve the beers.

The expert evidence before this committee is clear that a small amount of preservative is not dangerous, while the evidence and analysis of samples show that a very small amount of preservatives are used, and that by very few of the brewers, who use it in minutely small quantities to preserve bottled beer for export only. And the evidence is overwhelming that nearly every brewer and every bottler of beer in this country submits his bottled beer to the pasteurizing processes, which is simply submitting it to such an extreme heat in the bottle as to destroy germ life and prevent fermentation.

The revenues derived from the great beer industry alone are \$71,000,000, a double war tax. The value of money invested is \$650,000,000, and the industry gives employment to 900,000 men.

In the language of Mr. Gladstone, this committee feel that we should "liberate as to choice of material and as to process of manufacturing an industry of so vast a scope as is this particular industry."

As to the other question, of fixing a standard of beer, ales, and porter—that is, by fixing the minimum amount of alcohol, malt extract, etc.—every witness before this committee testified in favor of fixing said standard.

Mr. Gallus Thomann, secretary of the United States Brewers' Association, favors such a law, as did every brewer and maltster who testified before this committee. And the committee is of the opinion that this may be done under the authority of the bureau that may be established in the Agricultural Department by Senate bill 2426.

Whatever legislation may be passed should be national in its character. The brewing industry of this country has grown so extensively that the American brewers are selling their products not only in every State of the Union, but all over the world, and uniformity of standard, which is most desirable, can only be obtained by national legislation.

OLEOMARGARINE.

In regard to butterine or oleomargarine, it is not claimed by any of the witnesses before your committee that it is in any way deleterious to public health. On the contrary, all expert evidence upon this point strongly confirms the testimony of the manufacturers of this article, to the effect that it is a healthful food product. The testimony shows that this product is the result of a combination of beef and pork fats, butter, cream, and milk with coloring matter, which is similar to that universally used by farmers and dairies engaged in the manufacture of butter for the coloring of that product. As under the resolution under which this committee is operating it is made one of its duties to investigate food products and to ascertain what is sold that is deleterious to the public health, your committee made every effort to obtain information upon this branch of the subject, and in addition to oral testimony there were submitted authorities of an expert character, as follows:

Henry Morton, Stevens Institute Technology, New Jersey:

It contains nothing whatever which is injurious as an article of diet; but, on the contrary, is essentially identical with the best fresh butter.

S. C. Caldwell, Chemical Laboratory Cornell University:

Possesses no qualities whatever that can make it the least degree unwholesome.

Charles P. Williams, analytical chemist, Philadelphia:

It is a pure and wholesome article of food, and in this respect, as in respect to its chemical composition, is fully the equivalent of the best dairy butter.

Henry A. Mott, analytical chemist, New York.

Essentially identical with butter made from cream, and perfectly pure and wholesome article.

J. S. W. Arnold, medical department, University New York.

A blessing for the public, and in every way a perfectly pure, wholesome, and palatable article of food.

W. O. Atwater, Wesleyan University, Connecticut.

It is perfectly wholesome and healthy, and has a high and nutritious value.

Scientific American :

Oleomargarine is as much a farm product as beef or butter, and is as wholesome as either.

Prof. Charles F. Chandler, New York City :

The product is palatable and wholesome, and I regard it as a most valuable article of food.

Prof. George F. Barker, University of Pennsylvania :

It is perfectly wholesome, and is desirable as an article of food.

It has been claimed by some that the coloring matter alluded to is a by-product of coal tar, and that if taken into the human stomach it might be dangerous to health; but, upon the evidence taken before your committee, there appears to be no foundation for prohibiting its use in the manufacture either of butter or oleomargarine.

As to the right of manufacturers to color their oleomargarine, it would appear from the tenor of late decisions in United States and States courts that the legislative branch would exceed its power by prohibiting the use of such coloring matter in the manufacture of either butter or oleomargarine, and in the opinion of your committee such legislation would be void, for lack of uniformity were permission granted to use coloring matter in one of these products to the exclusion of its use in the other.

There have been several recent decisions by the Supreme Court of the United States, the most prominent being the case of Schollenberger *v.* The Commonwealth of Pennsylvania, in which it is held that oleomargarine has been recognized for nearly a quarter of a century in Europe and the United States as an article of food and commerce, and has been so recognized by acts of Congress. The court refers to the act of August 2, 1886 (24 Stat., 209), "An act defining butter, also, imposing a tax upon and regulating the manufacture, sale, importation, and exportation of oleomargarine." One description of oleomargarine contained in this act includes, "all mixtures and compounds of tallow, beef fat, suet, lard, lard oil, vegetable oil, annato and other coloring matter, intestinal fat, and offal fat made in imitation of butter." The decision in the Schollenberger case holds, "that the manufacture of oleomargarine by the compounding of the ingredients named in this quotation from the act of August 2, 1886, is

recognized by Congress as being a lawful business and that the oleomargarine so produced is a lawful article of commerce."

It was claimed by some of the witnesses before your committee that the present laws are inadequate to carry out the original intention of legislatures, and that under the operation of the various laws regulating the manufacture and sale of oleomargarine it is sometimes sold to consumers as butter. Some of the witnesses who testified before your committee stated "that having asked for butter there were occasions when oleomargarine had been given them instead of the former article." The examination of the retailers of oleomargarine and butter who came before your committee tends to show that consumers of these articles know which of these products they are purchasing, but in many instances do not wish it known that they are using oleomargarine, and it is the testimony of manufacturers of oleomargarine before your committee that there is no instance of any consumer having ever brought action to prosecute dealers for having sold them oleomargarine instead of butter. This testimony has not been contradicted, nor has any proof of its inaccuracy been offered.

There has been much evidence and argument before your committee as to whether the manufacture of oleomargarine is detrimental to the interests of the farmers of the country. The evidence shows, however, that all of the ingredients entering into the composition of both butter and oleomargarine are the products of our farms, with the possible exception of the coloring matter, the use of which is infinitesimal in both cases.

The resolution under which this committee was appointed does not authorize investigation except:

- First. What food is sold that is deleterious to the public health; and,
- Second. What food is sold in fraud to the consumer.

The committee finds from the evidence before it that the product known commercially as oleomargarine is healthful and nutritious, and that no additional legislation is necessary.

CANDY AND CONFECTIONERY.

An important article of diet is the candy consumed by the children of the country, a natural and proper element of food, which has been greatly adulterated, and in the opinion of the committee still is. The confectioners who were subpoenaed to testify before this committee testified that the coloring matter that they used was pure vegetable coloring matter, which is proper to use and is used in butter and oleomargarine. Yet the fact remains that large amounts of analine dyes, a product of coal tar, are used in the coloring of candy. It is also undoubtedly true that to some extent terra alba is used. This would fall under the rule adopted by the committee, and ought to be, in the opinion of the committee, absolutely prohibited, and it is also thought that the bill recommended by the committee will enable the Government to prosecute and convict those engaged in this business. The honest manufacturer of confectionery and the consumer of it will favor such a bill. Those engaged in the adulterating business ought not to be consulted as to their wishes.

WINES.

A large amount of evidence has been taken in regard to wines and liquors, and it may become necessary to have a separate bill as to this article. It is thought, however, by the committee that the Government will have sufficient power under the bill recommended to compel the proper branding of the wines so that the consumer may know with a reasonable certainty what he is purchasing. The manufacturers of champagne in this country have complained bitterly that the American product is being injured by the sale of artificially charged wine which is being sold as champagne. Champagne originally meant wine that came from the champagne districts of France. It is contended by the manufacturers of American champagne that the trade word "Champagne" means any wine fermented in the bottle. A large class of American manufacturers, however, are engaged in carbonating still wine artificially by the injection of carbonic acid gas, and that wine is also sold in the market as champagne.

The tests made by the experts show that the American champagne which is fermented in the bottle excels in practically every point the imported champagnes which are also fermented in the bottle, and, under the evidence of uninterested witnesses, it is clear to the committee that champagne fermented in the bottle is superior in analysis and very much more expensive to the producer than the wine which is artificially carbonated. For the purpose of bringing this question within the rule adopted by the committee it is not necessary to make any decision as to the true definition of true champagne. It is admitted that the artificially charged champagne is cheaper than that fermented in the bottle.

It is claimed by the manufacturers that it is just as good or better than the wine fermented in the bottle. If that is true there ought to be no objection to having it marked for what it is, and the committee recommend the amendment offered, which compels the manufacturer of carbonated wine to place upon the outside of the bottle the word "carbonated" in distinctly legible letters. The committee does not say by this recommendation anything against artificially carbonated wine. It simply follows the set rule that it should be sold for what it is.

CINNAMON AND OTHER CONDIMENTS.

As before stated in this report, the ground pepper and other condiments, including cinnamon, mustard, ginger, etc., are all more or less adulterated, usually with peanut shells or cocoanut shells, which may not be deleterious in themselves on account of the small amount used, yet the committee is of the opinion that this bill ought to pass, that there may be a standard fixed by the Government which must be met by the manufacturer of these food products, or, failing to meet it, to state for the benefit of the consumer how much below the standard their prepared food is.

There are many standards; almost as many standards as there are manufacturers. This bill is not intended to interfere with those well-known trade preparations of blended condiments, but the object of the committee is to give the consumer the benefit of knowing what he is purchasing, and to free the honest manufacturer from competition with adulterated goods. It is a well-known fact that ground pepper is

cheaper than the pepper before it is ground, showing conclusively that it is adulterated, or that some disinterested manufacturer is willing to pay something for the privilege of grinding pepper. This applies to a thousand articles of food, herbs, fruits, and drinks, and there is absolutely, in the opinion of the committee, no relief except there be a uniform standard.

State laws will not do, for the reason heretofore given, that American manufacturers trade in all the States and want a uniform law. It is not intended by this statement of the committee to discourage the passing of pure-food laws by the States. Such laws will be helpful, and, if the Senate bill recommended becomes a law, the standard fixed on food products by the Government of the United States would in all probability be adopted by the State legislatures and boards investigating the matter. In any event the standard of food should be uniform.

CREAM OF TARTAR.

The evidence of the Government chemists shows that practically every sample of cream of tartar which were purchased in groceries and drug stores was a fraud. His evidence shows but one sample having the least trace of cream of tartar in it; that he did buy samples, at the cream-of-tartar establishments, which were pure, and which he took as standard for making other analyses. This adulterated cream of tartar is known to the trade as C. T. S., which means cream of tartar substitute, which is a product of alum and has no place in the diet of a human being.

Cream of tartar, as shown by the evidence, is a natural food product from the grape, and is an article of very common use, not only in the manufacture of baking powder, but among the millions of families who buy, or try to buy, cream of tartar and make their own baking powder as they need it. But, by this deception, thousands of people eat this cream of tartar substitute, which is alum, who would not willingly use alum as an article of food. Such deception and adulteration should be prohibited by law.

IMPORTED ADULTERATED FOODS.

If it is the policy to restrict our own citizens to the use of pure food, we certainly should apply the same rule to foreigners who manufacture goods to be sold in this country. There is no doubt in the minds of the committee that large amounts of imported goods are sold in this country the sale of which goods would be prohibited in the country from which they come. To explain more fully, the dried, imperfect beans of coffee screened out in Germany by the ton are shipped to this country and known as "black-jack," and reputable grocers who have testified to the mixture of this product with good coffee also testified to their anxiety and willingness to abstain from so doing, if their competitors could be compelled to do the same. Such business men are driven to the situation of going out of business or meeting competition by the methods adopted by their competitors.

It is believed that if Senate bill 2426 becomes a law that the board will fix a standard of coffee which must contain a minimum amount of caffeine or extract of coffee. This would fix a standard, and by making an inexpensive examination and test at the port of entry, practi-

cally pass on every pound of coffee sold to the people of the United States. Again, take imported beers. Some of the countries which import beer into this country absolutely prohibit the use of antiseptics or preservatives for the beers sold in their own country, but do not prohibit the use of it for export purposes, and the analysis shows, in some of the imported beers, the presence of some of these preservatives.

The committee has not had opportunity to examine all the laws of other countries upon the subject of beer standards, but, taking to be correct the evidence of witnesses before the committee, even the countries requiring a standard of beer for their own consumption do not require any such standard if it is to be sent to America for consumption. What was said before about coffee would apply to this product as well, and if a standard is not fixed for our domestic beer it should be for imported beer, for the reason that beer that is shipped a long way in wood has greater need of preservatives than that which is made nearer home for practically immediate consumption.

PRESERVATIVES.

Under this head an immense amount of evidence has been taken. The indiscriminate use of preservatives in different food products is a dangerous practice and one which ought to receive the most careful supervision. There is no doubt in the minds of the committee that much carelessness is covered up by the use of preservatives. According to the evidence of Dr. Wiley the use of small amounts of preservatives under certain circumstances is not in the least degree dangerous to public health.

It is impossible to call attention to all or even a great part of the articles of food which are adulterated. It is thought by the committee that for the present we have called attention to enough to show the plan of legislation and the necessity for it.

ADULTERATION OF FOOD PRODUCTS.

TUESDAY, *March 7, 1899.*

Committee met and organized in the rooms of the Committee on Manufactures, in The Maltby, Washington.

Mr. HARRIS. I make the motion that the chairman of the committee, as a subcommittee, be authorized to hold meetings at such time or place as he may see fit for the purpose of investigating and taking evidence.

STATEMENT OF AUGUSTINE GALLAGHER.

AUGUSTINE GALLAGHER was the first witness. Being duly sworn, he testified as follows:

Senator MASON, chairman. What is your name?

Answer. Augustine Gallagher.

The CHAIRMAN. What is your business, Mr. Gallagher?

Answer. I am engaged in the publishing business, but at this time I happen to be a revenue agent in charge of the enforcement of the mixed-flour law, an act of Congress.

The CHAIRMAN. That is part of what is known as the war-revenue act, approved 1898?

Answer. Yes, sir.

The CHAIRMAN. When were you appointed revenue agent having that in charge?

Answer. August 14, 1898. I was commissioned previous to the enforcement of the act, which went into effect the 15th day of August.

The CHAIRMAN. What have been your duties since your appointment?

Answer. I was given a commission as revenue agent, but was also given a letter of instructions in addition to look after the enforcement of the mixed-flour law. I was to go from place to place and confer with the other revenue agents who were appointed to enforce the mixed-flour law.

The CHAIRMAN. Have there been any seizures of mixed flour that has not been properly stamped under the law?

Answer. There have been quite a number of such cases, of finding flour that has been mixed with products other than wheat.

Mr. HARRIS. I would like to ask you in regard to the duties of mixed-flour inspectors, what were you authorized to do, what steps did you take, what was it necessary for you to do to carry out the objects of the law?

Answer. The law, as you gentlemen all know, was enacted in the rush that characterized the work of the whole war-revenue act. The flour sections were incorporated as a part of this act as a result of the efforts of Senator Mason. There was no time to consider details. The law provided for twenty agents and clerks.

Mr. HARRIS. You were put in there just as the other revenue agents were?

Answer. I was asked to accept the position on account of having represented the millers and the milling industry, and because I had given evidence that was submitted to Congress on this question which resulted in the act. In answering your question I would like to tell you what I did. In Senator Harris's State I knew where there was a miller—no names need be mentioned—that had been mixing flour. The mill had borne a good reputation. My opinion was that they were forced by competition to mix flour rather than by a desire of gain. I proceeded to that mill, and under the authority I had I made a thorough examination. There I found stored on the premises a large amount of glucose starch. There was a case where the man had been mixing glucose starch into wheat flour. The flour act does not give anyone the power to prevent a miller from occupying his premises with adulterants, and any amendments you can pass should provide for this. But the law did authorize me to give this man to understand that he had been suspected of using starch for an adulterant, and I informed him that I would take a memorandum of the amount of starch on hand and the next agent would see if he had the same amount still; if not, he would find out what he had done with it. As a result he took out a license. He did not want the revenue agent to bring him into court, so, as a result, he took out a license. He now mixes flour, but does it according to law. His license is an evidence of the fact that a representative of the United States has examined his plant and that he now operates it according to law.

Mr. HARRIS. Do you think that he is using this now, and under the law it is properly branded, and such brands indicate what it is?

Answer. He would not dare to do otherwise. It would compromise his mill and get him into serious trouble. He explained to me that he did it for only five or six customers out of his total trade. He had to do it or quit the trade of these customers. I don't suppose he has worked off that glucose yet that he had stored there.

The CHAIRMAN. Let me ask you with regard to inspecting the products of the mills where they mix. Do you examine the branded packages?

Answer. Yes, sir.

The CHAIRMAN. You may state what, if any, suggestions you have to make based upon information which has come to you as an agent in charge of this matter for the Government, as to any amendment that ought to be made to the pure-flour act.

Answer. My experience in the enforcement of the law leads me to advise that the act be amended as it now stands by leaving out the self-raising pancake and buckwheat flours, etc. It was not our intention, when we had a hearing on this question and when the matter was discussed, to include those flours. The self-raising flour is not an adulterated flour at all, at least it has never been so considered; it is pure flour which has added to it leavening qualities. The millers make the self-raising flours to accommodate housewives. It does away with the long raising of bread and is mixed ready for use. I think the act should be amended so that the people manufacturing it can have relief. Those manufacturing self-raising flours have now to take out licenses and stamp their goods for what they are, in case wheat is the principal ingredient. I think the act should also be amended to provide licenses for dealers in mixed flours, even though it would call for a nominal tax. The man who buys mixed flour from the manufacturer should be compelled to keep a record.

The books of the manufacturers are open to us and we know where they sell these goods. A sells goods to Smith & Co., but Smith & Co. are not under any obligations to tell the revenue agent where they sell the goods. The law does not compel the dealer to pay taxes and he keeps no record. If you only tax him for 50 cents a month it would be a good thing to compel the dealer to keep records.

Another feature of the law that I think should be amended would be to provide a penalty for failure to report business transactions. I found one manufacturer in Indiana who had not reported for three months; he had bought about three thousand revenue stamps. His records showed this, but he should be compelled to report in duplicate, under penalty. In this way the revenue agents can check the offices of manufacturers thoroughly. The manufacturer I have in mind was conducting his business as though he were doing business with a huckster instead of the Government. There was no penalty which could reach him. This is one of the results of the rush in passing the act that I spoke about, though we considered ourselves very fortunate to get the act at all.

The CHAIRMAN. Evidence given in the former hearings before this committee showed that ground clay, known as mineraline, and ground stone, known as barytes, were used in adulterating flour before this act was passed. What are the facts now in regard to that, so far as your information goes?

Answer. I would state that I believe that there is not one pound of flour in the United States so adulterated. I am of the opinion there never has been, since the day of the enforcement of this act, a pound of flour adulterated so.

Mr. HARRIS. You think, then, that the effect of this act has been to destroy the use of those articles as adulterants?

Answer. I am positive of it. My investigation throughout the entire extent of territory that was subject to adulteration, or the territory in which the adulteration was carried on, goes to show that to be the case. There were a large number of cases of adulterated flour which I discovered and held to be taxable under the law. There have only been one or two cases where the flour was made and offered for sale contrary to the act since the enforcement of the law. The flour was in most cases made before the enactment of the law. As I described to you, Mr. Chairman, I had just before coming here found 1,200 barrels of mixed flour in the South, which flour had been in that mill since May, stock on hand, but under section 49 it was held to be taxable, under the clause in which it states if found on the premises after date of the law's enforcement. We found a great deal of mixed flour made previous to the law's enactment subject to taxation; but there is some very wholesome flour, corn and wheat mixtures, made under the mixed flour law. It has served its purpose to a remarkable degree.

The CHAIRMAN. Do you remember when you were before this committee calling our attention to the existence of a certain factory which made a certain article from ground clay? The York Manufacturing Company, you remember calling our attention to that?

Answer. I do.

The CHAIRMAN. Are they still manufacturing that article; if so, for what purpose is it used?

Answer. The production of that article is quite an industry in itself. Of course my investigation never led me to inquire regarding any food except flour. The organized millers made at least one analysis which should be presented. My personal investigations led me to Tennessee and Georgia; there I discovered, on inquiring of a transportation agent,

that the stuff was being shipped. It was not exactly clear from what he said what was being done with it, but I was convinced from what I learned that there were a few mills that had at least experimented with it in flour. It was of course supposed to be a dangerous thing to do. If known the man who did it would, of course, lose his reputation as a miller. Nevertheless, there were some experiments made which encouraged these people to believe the adulterant mentioned might be adopted by the milling trade, and on this assumption they sent the letters which you reported to the Senate. We got out of it so promptly that I am convinced that the business of so adulterating of breadstuffs was never acceptable and never got outside of the two States mentioned, and those were the States in which the adulterants were produced. I am told—I don't know; I never made an examination; I never undertook to separate them—that there are several food products that carry that mineraline.

The CHAIRMAN. That is what we are anxious to know; and while you say that you have no personal knowledge, I would like information on that.

Answer. I have heard people discuss the matter at table and at bars where powdered sugar is used. You find the residue of the sugar in the bottom of the glass when used in transparent drinks. I have found that it is adulterated and is insoluble, and should be stamped. My observation is that it is practically clear before placed in the article that it is to sweeten.

Mr. HARRIS. You have positive knowledge concerning its use in sugar?

Answer. I have no positive knowledge. I have been informed by several reputable members of the trade that this article is used in feed-stuffs.

Mr. HARRIS. Can it be used in shorts?

Answer. Yes; I will cite an instance which could be used to justify people who are otherwise well informed, but who would not take the trouble to investigate their purchases. You will come to a mill, we will say, to buy feed; the miller would say, now there is a nice rich feed. You take up a sample of the bran and find that it apparently has much flour sticking to it. You are sure it is rich; there is a good deal of flour in the bran, you think, and is apparently clean feed, and you have proof of rich feed.

The CHAIRMAN. Looks like bran that had not been thoroughly bolted out?

Answer. Yes; the adulteration is very easy. I consider this feed-stuff question as very important, gentlemen; I attach more importance to it than I did a year ago, when the flour law was passed, which is due to the fact that I have been almost continually among people who produce breadstuffs and feedstuffs, and I have learned in that time sufficient to at least satisfy me that the opposition—that is, the suspected opposition of some of the trusts of the country, the opposition of food-stuff and feedstuff manufacturers—has defeated general pure-food legislation in this country for the last ten years. That is the testimony of gentlemen who are interested in it.

The CHAIRMAN. In other words, those people adulterating feedstuffs for live stock are so much interested in protecting their own business that they have prevented any general pure-food legislation?

Answer. Yes, sir. I would base my answer on the information secured from Mr. Weddeburn, who assured me some time ago that the pure-food bill was defeated in the Fifty-third Congress by the cotton-seed mill influence. They considered that the measure was an attack on their industry, in spite of the fact that it was known that in not a

few instances clay was being mixed into feed. I would suggest that your committee would find very little difficulty in discovering positive proof that such practice is being carried on to-day.

Mr. HARRIS. Have you any information as to the extent of which cotton-seed oil is used in the manufacture of lard?

Answer. None whatever.

The CHAIRMAN. Previous to the passage of this flour act, what, if any, claims were made by manufacturers of adulterants as to their products being in demand on their own merits? What the adulterants were and what was claimed for them?

Answer. There were claims made by the manufacturers of corn flour.

The CHAIRMAN. That is where the corn grains are bolted?

Answer. Yes; and treated after the manner of wheat-flour milling.

The CHAIRMAN. Is there more than one kind?

Answer. There is only one kind of flour, but there is more than one kind of corn product. The principal ones are corn flour and starch, the latter produced by glucose factories. The manufacturers of these claim that both of these were quite healthful, and in the case of corn flour no one questions the truthfulness of this statement. They claim that in each case where mixing was being done that it was a reputable trade; that their customers were informed that such mixing was being done, and that the goods was then sold on its own merits; that no fraud was practiced; that not only the dealers but the customers, knowing what they were buying, wanted the goods, and that therefore there was no demand for the legislation then proposed. The result of the enforcement of the act is shown by the fact that 95 per cent of the people engaged at the time in mixing corn products into wheat flour have retired from that branch of the business. They will tell you to-day, as they have told me when I called on them, that people absolutely will not buy mixed corn and wheat flours when they know it, except in such form as they have been in the habit of getting for years—the flours in small packages, and flours that everybody expects will be mixed. Buckwheat flour, if often mixed with from 15 to 20 per cent wheat flour, so that the cake will hold together better when baked, some people are willing to buy this, though some people are not. It is generally conceded by the trade, by men who are honorable and reputable, that what was told you to secure the enactment of the flour law is true, and claims of those who said they could sell it just as well branded as not branded if they had to are answered by their failure to do so. Those men tell you to-day that they have absolutely no mixed-flour trade. I could refer you to some mills that are licensed under the mixed-flour act who are doing scarcely no business in mixed flour.

Mr. HARRIS. In other words, it proves it to be true that the people wanted pure flour?

Answer. It does, beyond a shadow of a doubt. People don't want a mongrel, they want real goods; they are satisfied to trust their judgment. If they want any mixing done they wish to do it themselves. They do not wish to be victimized in the mixing. People understand there is no use of any one mixing products unless they are making money by the process. The enforcement of the flour act has accomplished more in three months than was ever claimed for it by the most extravagant.

The CHAIRMAN. What effect has this enforcement on the exports of flour?

Answer. Our export trade in wheat flour has increased between 24 and 25 per cent during the first three months of the operation of the mixed-flour law.

The CHAIRMAN. Do you attribute that increase to the operation of the law?

Answer. I do, most assuredly, because our millers had borne an unblemished reputation previous to this adulteration plague, if you may call it so, and the knowledge of the practice of the mixing of flour had not been extensively carried abroad up to the time we secured the legislation. We are informed that the press abroad had just begun to take the matter up and begun to discuss it. If there was a damaging effect it would only be for two or three months, and those months would be about March, April, and May, a year ago. The per cent I give you was along in August, September, and October of the previous year.

Every day we have to consider the most gratifying results of the operation of that law. It was claimed by the people who assumed to represent the mixers that the enactment of the mixed-flour law would ruin the corn-milling business of this country, and that it would be an injury to the small dealers and the corn growers in this country. The facts are in the case that while the wheat-flour exports have increased more than 24 per cent during the months mentioned, namely, August, September, and October, 1898, the corn-mill exports during the same months increased about 48 per cent over the corn-milling exports of August, September, and October, 1897.

Mr. HARRIS. Have you heard from any source any complaint of the law?

Answer. None, except in regard to its enforcement in the case of self-raising flours. The people engaged in that line of trade are of the opinion that it works a hardship on them.

Mr. HARRIS. That was not the real object contemplated by the law.

Answer. No, sir.

Mr. HARRIS. The authorities in construing the law used the term mixed flour in a general sense.

Answer. Yes, sir; even the manufacturers who complain of this application in that particular are ardent friends of the act in general; they are its supporters and would not have it repealed under any circumstances.

Mr. HARRIS. My question with regard to the complaints was more intended to apply to its injuries for producers of corn and dealers in corn or wheat in any form.

Answer. I have heard some complaints in that respect. What is known as the glucose trust has been making some complaint. They set out a claim that their business has been hurt. Of course it does not mention the benefits of the public, and just why it should injure them if it is an honest work I have been unable to discover. Nevertheless, the concern has, it is said, issued several circulars.

Mr. HARRIS. I understand it was done as an illustration of the injury to their business.

Answer. We took no steps against any honest producers under this law. There is in it no word of harm to any legitimate business, but there is some complaint from that source that there is an injury to their business. There has been complaint from the millers of corn; that is but natural, because the mixing these millers have done was done for special customers and they have lost them.

Mr. HARRIS. Is there any demand for corn flour on its merits as an article of food?

Answer. Yes; it is an excellent article of food.

Mr. MASON. It is used in such forms as cornstarch, is it not?

Answer. Yes; there is a demand for corn flour at the confectioners. There is more demand for some grades of corn flour than the manufacturers can supply.

Mr. MASON. I have a communication from two different sources saying that the cracker and biscuit trusts were using this adulterated flour. Have you any information about it?

Answer. When I was in the West last summer I received an intimation of that same character, and proceeded to personally inspect two or three bakeries. I found no evidence of adulterated flour, but what they might be doing in twenty or thirty other places I could not say. These bakers, I became satisfied, are producing the character of goods that an undue amount of starch would ruin. I should think that some of the goods produced by the combined bakers would bear an amount of starch which the old-fashioned crackers would not.

Mr. HARRIS. You say you inspected these bakeries. Could you tell if their goods had been mixed?

Answer. Yes, sir.

Mr. HARRIS. Without a chemical examination?

Answer. I would apply the sense of touch; it is simple; if it was very starchy that would show it. If not the microscope might reveal it. If in doubt I would send a sample to the laboratory. The Department has adopted the use of a microscope of 350 diameters power, which reveals the presence of corn granules in the wheat very readily. After that the practice of the Department is to submit the samples to the chemical bureau of the Treasury Department. I think in my experience of the use of the microscope in all cases of doubt that not 5 per cent of my suspicions have proved to be cases of pure flour.

Mr. MASON. Have you had any communications from people from over the water to whom we have sent our flour since the operation of this law, and can you state what feeling there is as to the effect of our law?

Answer. Yes, sir, I have. The importers of American flour—foreign importers—are a unit in admiration of the promptness with which the American people came to the rescue of flour millers and our present system of guaranteeing the purity of their goods. I think I could furnish you with evidence in this connection which would be most convincing to any one.

Mr. MASON. Will you give us any letters or communications which we can use?

Answer. If desired, I will have the Modern Miller Company, of which I am a member, furnish you with letters received from leading handlers of American flour abroad.

There being no other witnesses present, the commission then adjourned.

NOVEMBER 28, 1899.

DEAR SIR: I have the honor to hand you herewith the transcript of my evidence before your commission.

I also hand you letters from foreign buyers of American flour, as requested by your honorable commission.

I am pleased to note that these letters, from representative importers of American flour, positively emphasize the importance of such legislation and the great good it has done.

I am, sir, respectfully,

AUGUSTINE GALLAGHER.

Hon. W. E. MASON, Chairman Pure Food Commission, Washington, D. C.

ADULTERATION OF FOOD PRODUCTS.

LONDON, October 12, 1899.

DEAR SIRS: Replying to yours of the 16th ultimo, with regard to the pure flour law now in operation in your country, since this act was passed by Congress it has certainly restored confidence on this side, and in my opinion will materially assist your export trade.

Yours, faithfully,

W. M. MEESON,
Per JOHN STANMORE.

The MODERN MILLER, St. Louis.

BREMEN, October 13, 1899.

DEAR SIR: In reply to your esteemed favor of the 16th ultimo, I can only state that the trade in American flour in this country will certainly be extended by a Government guaranty of the purity of the flour produced in the United States.

Yours, truly,

GOTTFR. LUCE.

AUGUSTINE GALLAGHER Esq.,
President of the Modern Miller, St. Louis.

LONDON, E. C., October 10, 1899.

DEAR SIRS: Your circular letter of 16th September to hand; contents noted. We have much pleasure in stating that the pure-flour law has worked very well indeed, and we have now more faith in buying American flour since its purity is assured. We certainly think that without such a law preventing adulteration of American flour with maize the trade in American flour in this country would have suffered considerably.

Yours, truly,

MORRIS & Co.

The MODERN MILLER, St. Louis, Mo.

GLASGOW, September 29, 1899.

DEAR SIRS: In reply to your circular letter of the 16th instant, we would state the firms we correspond with on your side are of a class that would not condescend to shipping an adulterated article. We are not aware that we have ever received a sack of flour that we could say contained anything but pure wheaten flour. At the same time, we know that others have not been so fortunate, and, therefore, legislation in the direction aimed at by your pure-flour law was necessary, and your export trade will benefit thereby.

Yours, faithfully,

BRUCE & WILSON.

Messrs. The MODERN MILLER, St. Louis.

LIVERPOOL, September 30, 1899.

GENTLEMEN: We are in receipt of your circular letter of the 16th instant, and in reply beg to say that the trade here in American flour depends naturally on the quality, and any adulteration with corn products would doubtless injure the sale and restrict the imports, but we do not believe that much, if any, adulterated flour ever came to this market. We shall be glad if Mr. Hall will report to us what he is doing in the matter of Mr. J. F. Imbs.

Yours, faithfully,

REID & GLASGOW.

Messrs. The MODERN MILLER, St. Louis.

ROTTERDAM, October 3, 1899.

DEAR SIR: In reply to your letter of September 16, we beg to say that while being advocates of such legislative measures as the pure-flour law or the "A. A. L." we prefer to abstain from expressing any opinion on its good effects on the export of American flour to the Continent.

Believe us, dear sir, yours, truly,

W. SCHÖFFER.

AUGUSTINE GALLAGHER, Esq.,
Manager of the Modern Miller, St. Louis.

LONDON, October 7, 1899.

DEAR SIR: We beg leave to acknowledge receipt of your favor of the 16th ultimo, inquiring whether the new pure-flour law on your side has benefited the American flour trade here, and in reply to same we have to say that it has most certainly done so, inasmuch as we can now buy with safety from almost any miller on your side, whereas before this law was passed we had to be somewhat careful in choosing our miller, it being a well-known fact that some were adulterating; but this now being illegal, we look for an improvement here in the imports of American flour.

We are, dear sir, yours, truly,

BEGBIES, ROSS & GIBSON.
Per BERNARD BARTOW.

Mr. AUGUSTINE GALLAGHER,
The Modern Miller, St. Louis.

GLASGOW, September 30, 1899.

DEAR SIR: We are in receipt of your favor of 16th, regarding the effect that the pure-flour law has on our trade, and we do not think that the confidence of the Scottish trade was in any degree shaken in American flour, as no case has ever turned up in Scotland in which adulterated flour has been discovered, as far as we know. However, there is no doubt that the fact that the purity of flour is under the charge of the state office will convince buyers that there is no adulteration possible, and that they will be protected from unscrupulous millers. We have, therefore, no hesitation in indorsing the benefits that this law has on this side.

We are, dear sir, yours, truly,

MOWAT BROS.

Mr. AUGUSTINE GALLAGHER,
The Modern Miller, St. Louis.

AMSTERDAM, September 29, 1899.

DEAR SIRS: I herewith have the pleasure to acknowledge receipt of your esteemed favor of the 16th instant, and in kind reply I am glad to state that the pure-flour law is indeed of material benefit to the American flour trade in this country.

The adulteration of American flour had become already common gossip, but since the law is effective, confidence in purity of American flour is returning.

I am, dear sirs, yours, truly,

MATHIEU LUCHSINGER.

The MODERN MILLER, St. Louis, Mo.

ANTWERP, October 3, 1899.

DEAR SIRS: We are in receipt of yours of the 16th ultimo, contents of which had our careful attention.

Long before the enactment of the pure-flour law the American trade journals fought the adulteration of flour, spreading out the news all over the world and warning buyers against the evil. Incontestably the American flour trade has considerably suffered during the period preceding the enactment of the pure-flour law. We were very often called upon to defend the reputation of our American friends. Before this wretched idea of adulterating flour was hatched there never was any question of guaranteeing the purity of the American product; such guaranty was, however, very often requested then. Even some sales had to be made under analysis.

We are quite convinced that if the law had not passed, distrust would have been so widely spread that the American flour trade would have considerably suffered through it.

The trade will be grateful to those who have worked to the edification of the pure-flour law.

Yours, very truly,

EUGÈNE M. JANSSENS.

The MODERN MILLER, St. Louis.

BRISTOL, September 30, 1899.

DEAR SIR: In reply to your favor of the 16th instant, we have much pleasure in testifying that we believe the operation of the pure-flour law referred to has been of material service in the promotion and development of the trade in flour between the United States and this country, as it arrested just in time a pernicious system of

adulteration which would soon have spoiled all confidence in the purity of any flour imported from the States, and would eventually have ruined the industry. Always at your service, we are,

Yours, truly,

AUGUSTINE GALLAGHER, Esq.,
The Modern Miller, St. Louis, Mo.

ARTHUR JAMES & CO.

BRISTOL, September 27, 1899.

DEAR SIR: In reply to your circular letter, we have no hesitation in stating that the benefit to the trade in American flour in Europe under the operation of a pure-flour law would be considerable.

Yours, truly,

AUGUSTINE GALLAGHER, Esq.,
The Modern Miller, St. Louis.

CHAMBERLAIN, POLE & CO.

LONDON, E. C., September 27, 1899.

DEAR SIRS: We are in receipt of your favor of the 16th instant with reference to the operation of the pure-flour law.

We do not think that before the passing of this law the question of adulterating American flour with maize products affected our markets to the extent that it did those on your side. We believe that importers here had not the same trouble with adulterated flours that buyers in America had, although we heard of a few cases, but we feel sure that a law such as the "pure-flour law" is bound to do good, as had it not been passed there is no saying to what extent shipping adulterated flour to United Kingdom markets might have grown.

Yours, truly,

R. HUNTER CRAIG & CO., LIMITED,
Per H. E. PRIOR.

The MODERN MILLER,
St. Louis, Mo.

HAMBURG, October 6, 1899.

DEAR SIR: Confirming our last letter of the 4th instant, we beg to give you to-day another opinion from a friend in Altona, who writes as follows: "If the flour sent to Germany is mixed up with corn meal, the importer of it will be prosecuted, and none of the dealers would run such a risk; if he would not be sure to get good stuff, as soon as there is the probability that any adulteration could happen it would cut off any further import of American flour. The German Government is very much attentive to such things, and in the case that such a consignment should arrive and be discovered, it would be the ruin of the importer."

In Germany the flour is imported on account of its greater baking qualification, but the adulteration of it with corn meal will make it heavier, and such a flour would be unsalable, therefore the strongest maintenance of the pure-flour law is necessary to keep up a regular business with the States, and is a main question for the American millers, as far as the export to Germany is concerned.

Very truly yours,

IARCK & MEYER.

AUGUSTIN GALLAGHER,
President of the Modern Miller Co., St. Louis.

HAMBURG, October 4, 1899.

DEAR SIR: We have your favor of September 16 and have interviewed several of our large dealers in American flour with regard to the pure-flour law, and hear an interesting story from Dresden, Kingdom of Saxony.

Our friends write as follows:

"The rumors of adulteration of American flour went through all our papers and the consequence was that nearly all our bakers abstained from buying any more American flour, and especially in Dresden, Freiberg, Meissen. Government officials went round to the bakers and investigated whether they were using American flour, and, if so, took samples and analyzed them."

"Things even went so far that bakers and the public were warned in the papers not to buy American flour, and my report to the police that there were also good brands, which were as pure as they could be, was answered to the effect that they were

ordered by the internal ministry to look into the matter as sharp as possible, and so my whole business was upset.

"My trade was thence in 'Columbia' and 'Rex patent,' and I had them analyzed, and made known the result in a number of papers, and by and by our people forgot, over the fine quality, the old stories; and agitations once made by our millers and farmers against your flours have slowly died away, and I suppose that the American pure-flour law will help to reassure our people of the absolute purity of American flours, and to enlarge trade to great extent."

Very truly, yours,

MR. AUSTIN GALLAGHER,
President of the Modern Miller Company, St. Louis.

IARCK & MEYER.

AMSTERDAM, October 17, 1899.

GENTLEMEN: We are most happy that, by having to answer your esteemed favor of September 16, we should be afforded an opportunity to state our fully indorsing the opinion of your esteemed president: "That the enactment of the pure-flour law has greatly benefited the American flour trade in foreign countries, restoring confidence wherever the same had been shaken." The events in our own country enable us to furnish a proof for this statement. In the course of 1898 the Holland millers, backed by the protectionists, exerted themselves to obtain the levying of duty on foreign flour and tried to support their claim by aluding to the alleged doubtful purity of the American flour. Discussing their petition in our Parliament, our state secretary of finances, the Hon. Pierson, refuted their argument by pointing most emphatically at the existence of the pure-flour law in the United States.

It is our strong conviction that the exporter as well as the importer should allow the widest scope of guaranty to ascertain the purity of the food stuffs they are dealing in. Measures by Government, as well as those taken by persons who are in some way interested in the flour trade, should be supported as much as possible. Nor should we rest satisfied at having done so much. One of the common points of human weakness consists in attaching a higher value to what one sees being performed before one's own eyes than to the result of any operation or measure carried out in foreign parts.

So the permanent analysis of American flour by a Holland chemical station is much more apt to impress upon the Holland people the value of its good quality than the existence of a law whose enactment can not be looked after by them. Many American millers and their importers have taken this circumstance into account and have submitted their brands to a regular control of some home chemical station.

We firmly believe that all United States millers who understand their true interests and are wishing to promote the growth of their export trade, in order to suppress and remove all room for suspicion, should require their Holland importers to have their produce put under the regular and constant control of some recognized chemical station in Holland itself.

Yours, very truly,

THE MODERN MILLER,
St. Louis.

ZEE GRIPPELING.

HAMBURG, October 25, 1899.

DEAR SIRS: Acknowledging receipt of your favor of 16th ultimo, I have the honor to inform you that the pure-flour law is of the greatest importance. By this law the confidence as regards the purity of American flour has come back again, which has been strongly affected by the German Juizos. How far this agitation against American flour has gone I will tell you. As you know, I am agent of Messrs. Washburn, Crosby & Co., Minneapolis, for Germany, and have in all large cities of Germany subagents for the sale of their products. In all these cities, as Berlin, Hamburg, Dresden, Leipzig, Manheim, Magdeburg, Chemnitz, Frankfort-on-the-Main, and so on, the authorities, in consequence of denunciation, have drawn samples of the Washburn products but, as I anticipated, they were found pure. What consequences might have arisen if they had not been pure you may easily imagine. Firstly, they would have condemned me to a high penal sum if not to a confinement, and the import of American flour would have been prohibited.

By the fact that the flour was pure and by your pure-flour law the confidence of the German buyers is again reestablished.

Very truly, yours,

GUSTAV KRÜGER,
Weisheim.

THE MODERN MILLER, *St. Louis.*

COMMITTEE ON MANUFACTURES,
UNITED STATES SENATE,
AT HEADQUARTERS, GRAND PACIFIC HOTEL,
Chicago, Ill., May 3, 1899.

The committee met at 10.30 a. m.

Present: Senator MASON (chairman).

Dr. H. W. WILEY, chief chemist, United States Department of Agriculture, appeared.

STATEMENT OF DR. H. W. WILEY.

Chief Chemist of the United States Department of Agriculture.

The CHAIRMAN. You may state your name, residence, and occupation.

Chief Chemist WILEY. H. W. Wiley; residence, Washington, D. C.; occupation, chief chemist, United States Department of Agriculture.

The CHAIRMAN. How long have you been in that Department?

Chief Chemist WILEY. Since the 9th of April, 1883.

The CHAIRMAN. Sixteen years this month?

Chief Chemist WILEY. Sixteen years last month; the seventeenth year of service.

The CHAIRMAN. Are you a graduate of any medical or scientific school?

Chief Chemist WILEY. I am a graduate of Harvard University, class of 1873, and subsequently took a course in a medical college in Indiana, graduating with the degree of M. D. After that I studied chemistry, and especially food chemistry, in the university at Berlin in 1878-79. I was appointed chemist in Purdue University and State chemist of Indiana in 1881 and served in that capacity until I took my present position as chief chemist in the Department of Agriculture. I have been president for two years of the American Chemical Society and have been vice-president of the American Association for the Advancement of Science, and have been president of that association. I am a member of the chemical section American Chemical Society, German Chemical Society, and Federated Institute of Brewing in England. I am an honorary member of that body. I have been president of the Official Agricultural Chemists of the United States, composed of all the chemists having any official connection with the Government, either for State or municipal bodies, or boards of health, and have been permanent secretary and executive officer of that association for eleven years, and am still.

The CHAIRMAN. During your connection with the Agricultural Department what have been mainly your duties as chief chemist?

Chief Chemist WILEY. My duties of chief chemist have been the investigation of all problems of a chemical nature relating to agriculture or agricultural products, especially our foods.

The CHAIRMAN. In the course of that service have you had occasion to analyze manufactured articles of food which have been exposed for sale upon the markets of this country?

Chief Chemist WILEY. I have had occasion to make careful examination of almost every variety of food that has ever been exposed upon our markets for sale.

The CHAIRMAN. Is that also so as to drink?

Chief Chemist WILEY. Also drinks, because you include in foods all the beverages which are used and also all condiments. The term "food" embraces foods of any description and condiments. One term represents all.

The CHAIRMAN. When you speak of food products, technically that means all food and drinks and condiments, all that goes into our stomachs for the purpose of sustaining life.

Chief Chemist WILEY. Yes; for the purpose of sustaining life and ministering to the taste or as stimulants. It embraces the whole range.

The CHAIRMAN. Well, now, Doctor, I wish you would, for the benefit of this committee and for the benefit of the United States Senate, to which body we must report, give us some information regarding articles of food consumption that are being adulterated in this country, basing it upon your experience and analyses.

Chief Chemist WILEY. Among the first of the products which I investigated as chemist of the Agricultural Department were dairy products. This was done before the passage of the oleomargarine law, and in this investigation I determined as far as possible the degree and character and extent of the adulteration of dairy products. These adulterations I found to be of the following nature: In the case of milk the most common form of adulteration is the abstraction of the milk fat in the cream. Where this was not done water was often added in order to dilute the milk. I also found that preservatives were used in the milk to prevent souring. Boric acid, for instance, and formaldehyde have often been used for this purpose. In the way of the adulteration of butter I found that other fats, animal and vegetable, were substituted for the butter fat, as for instance, mixtures of cotton-seed oil and beef fat, and sometimes a high grade of pork fat—the highest grade of lard having been used instead of butter fat, and these compounds and mixtures were often sold as pure butter and commercially disposed of before the passage of the oleomargarine act, which compelled the stamping and branding of packages of this kind.

The CHAIRMAN. Do you consider the oleomargarine act, so called, of great practical use in stopping the sale of adulterated butter?

Chief Chemist WILEY. I think that where this act has been enforced it has been a great protection to the public.

The CHAIRMAN. Do you think now of any suggestions that you could make to this committee where it could be improved in the act itself—have you any suggestions to make?

Chief Chemist WILEY. I have not, of course, looked at the law from that point of view. My sole point of view would be to protect the public, and the farmers making pure dairy products, against fraudulent adulterations. The best legal way of doing this I have not investigated.

The CHAIRMAN. I mean this: Do you feel that the present law, if legally enforced, will have that effect?

Chief Chemist WILEY. I think it will.

The CHAIRMAN. Then, so far as the law itself is concerned, you have not in mind now any suggestion to make to the committee amending that present law?

Chief Chemist WILEY. Only this, which is hardly pertinent for me to make.

The CHAIRMAN. We call for it and think it is pertinent. We want your experience.

Chief Chemist WILEY. These mixtures of animal fats and vegetable oils, in my opinion, are perfectly wholesome and good in nutritious food. My only objection is that a large amount of these wholesome and nutritious foods are taxed, which does not look fair to them as foods. They are foods which are cheaper, and therefore many persons

in straitened circumstances prefer to use them; and if so, it does not seem quite right that they should pay excessive taxes upon such things as they require. If the public could be protected against fraud without tax, personally I should prefer it, as I see no reason why a person desiring a cheap and nutritious food should not be allowed to have it. What I do object to is seeing persons in straitened circumstances paying fancy prices, supposing they are getting butter when in point of fact they are not. Continuing, therefore, in dairy products I have found that in cheese there is a very common practice of adulteration, and one I believe which is often injurious, viz., the abstraction of the butter fat and the substitution of some other fat, forming what is known as "filled" cheese.

I used the word injurious in the above sense in the sense of fraudulent. Inasmuch as the added fats are usually pure and wholesome, but less valuable than the natural food, their substitution is a fraud to the consumer from a financial point of view. The cheeses which are made with these added fats are also to my taste less palatable and less desirable in every way than those made from the whole milk, although I could not say that they are less nutritious. Another food product which I have examined extensively is honey.

The CHAIRMAN. Yes; what about the adulteration of honey?

Chief Chemist WILEY. Honey, perhaps, is as extensively adulterated as any other food product in the United States, and this is especially so because glucose is very convenient and very cheap as an adulterant for honey. In the examination of a great number of liquid honeys purchased in the open market I found that a large percentage of them—more than half, in fact—were adulterated. Sometimes the adulterations are nearly complete substitutions, the quantity of real honey being only sufficient to impart a slight honey flavor to the mixture. In other cases the percentage of real honey was greater. Very often have I seen in jars pieces of honeycomb filled presumably with pure honey, but floating in a large excess of glucose, giving to the purchaser the idea that the liquid matter had exuded from the comb, while in fact it had been added to the honey bodily. The adulteration of honey, therefore, has proven probably as profitable as that of any other form of food sophistication.

The CHAIRMAN. You recognize, do you, that some of the adulterations are mere frauds and some are deleterious to the public health?

Chief Chemist WILEY. Yes; I make that distinction also, as, for instance, in the case just cited.

The CHAIRMAN. I would like to have your opinion as to what are frauds and what are both frauds and deleterious to the public health.

Chief Chemist WILEY. In my opinion glucose is not deleterious to health. It is wholesome, somewhat sweet, readily digested, and when used carefully, in my opinion, is not an injurious product. The fraud is a financial one—the substitution of the cheaper for the dearer sweet and the selling of the cheaper article for the natural and dearer product.

The CHAIRMAN. And it works not only a fraud upon the consumer, but is unjust opposition, is it, to the honest producer?

Chief Chemist WILEY. The adulteration of honey has almost driven to bankruptcy farmers who derive part of their income from genuine honey. And especially is this true in parts of California, where the farmers' chief income was from honey. It has injured every farmer who keeps a hive of bees, in diminishing the value of his product, so

that this form of adulteration has been a financial injury to these farmers.

The CHAIRMAN. Is there any national law—do you think of any way to regulate this?

Chief Chemist WILEY. There is no national law on the subject; absolutely none. The United States has no control in any way over the honey product, as it has over oleomargarine and filled cheese. These are both covered by law.

The CHAIRMAN. These are the only two products covered by national laws?

Chief Chemist WILEY. And the adulteration of flour. These are the only three that have any Federal legislation by way of protection of the consumer and the honest producer, and this protection is given in the guise of a revenue law.

The CHAIRMAN. Later on I shall ask you to advise the committee and the Senate as to legislation, but I want now your opinion as to whether the national laws governing flour, butter, and filled cheese, if properly and legally enforced, are effective for the purposes for which they were enacted.

Chief Chemist WILEY. In my opinion the laws relating to the three classes of bodies you have mentioned, when properly and legally enforced, give sufficient protection, but food laws should not have for their object the raising of revenue.

The CHAIRMAN. But what you said before as to the taxing of food products—

Chief Chemist WILEY. I repeat here.

The CHAIRMAN. Yes. In other words, if people wish to buy wheat flour which is mixed, they ought to be protected without paying a tax on it?

Chief Chemist WILEY. Yes, sir; I think so. It is simply a question of economy.

The CHAIRMAN. Now, have you finished; or do you care to say anything further in regard to honey?

Chief Chemist WILEY. No, sir. I think I have covered that ground sufficiently.

The CHAIRMAN. Along with the line of butter and cheese, have you analyzed and taken up the question of mixed lard?

Chief Chemist WILEY. Yes; I have made many examinations and investigations on the question of lard. The chief form of the adulteration of lard is the mixing of vegetable oils or fats, and in using other animal fats in lieu of the fat of the hog. This mixed matter has been sold very extensively in the United States under the name of "refined lard," and in so far as I am able to judge by chemical and physiological investigation it is as wholesome as pure lard, but the vegetable oils and other fats being less expensive than pork fat, it is a fraud and intended to be such, so that the mixture can be sold at a larger profit than pure lard. There is, in my opinion, no objection to the sale of any wholesome mixture of fats for culinary purposes if they are sold under their own names and brands. For instance, the cotton-seed stearin makes an excellent cooking material, and is preferred by many housekeepers on account of its being of vegetable origin, and the sale of this matter as such should not be restricted. It is only when it is sold as lard that it becomes fraudulent. The fat of the beef has also been largely mixed with lard, and this admixture is objectionable on the same grounds as those mentioned above.

The CHAIRMAN. Then I understand you to say that the mixing of the cotton-seed oil with lard is not deleterious to the public health, but is a commercial fraud?

Chief Chemist WILEY. That is the idea that I wish to convey.

The CHAIRMAN. Is that mixture of cotton seed oil and lard carried on to a large extent in this country?

Chief Chemist WILEY. At the time that I made my investigation some time ago it was carried on to a very large extent. Just to what extent it is carried on at the present time I am unable to state, but I imagine it is still a business of considerable magnitude. That is a matter of opinion, however, in regard to the present status. I might say this, in covering the whole ground of fats used as oil foods, that from a nutritive point of view all these fats and oils have nearly the same value as heat producers. They are exceptionally useful in the human economy, since the production of animal heat to maintain the body at a normal temperature is one of the chief functions of digestion. In this respect, as I have just said, the various fats and oils are almost of an equal value. The butter fat has a heat value of a little over 9,000 calories per gram, while the fat of the oleomargarine—that is, beef fat—has a slightly higher heat-forming value. It appears on the other hand, however, that butter fat is a little more easy of digestion, so that while the oleomargarine may produce more heat it may require a greater expenditure of energy to digest it. So that there is practically no difference in the value of these forms of fat in the animal economy.

The CHAIRMAN. How as to cotton seed oil?

Chief Chemist WILEY. It has practically the same value as oleomargarine for heat forming purposes.

The CHAIRMAN. It is easier of digestion, is it not?

Chief Chemist WILEY. It is probably a little more easy of digestion. In regard to cotton-seed oil I might say there is another fraud prevalent which I have not mentioned—that is, the selling of this kind of oil for another vegetable oil, viz., olive oil. That has been very extensively practiced in this country. It is a well-known fact that hundreds of barrels of cotton-seed oil go to France and Italy and return to this country as olive oil or mixed with olive oil. Now, for the purposes of sale as far as food value is concerned, there can be no choice between these two bodies. Personally I prefer the flavor of the olive oil, but that is a matter of taste. I know people who prefer the flavor of the cotton-seed oil, but cotton oil sells for only about one-fifth the price of olive oil, and hence if it is sold as olive oil, as is done to a very large extent, the profit is enormous and the fraud is correspondingly great. Just now there seems to be some improvement in this matter, as I have noticed in the last few months the dealers have left the word "olive" off of their bottles and are selling such oil as table oil, being careful not to put the name "cotton" on it. This is a fraud of great magnitude, and affects our consumers rather than our producers, although in California we have a very large number of persons engaged in the production of olive oil, so it affects our producers to a very large extent also.

The CHAIRMAN. Looking at it from a national standpoint, you feel that we have enough citizens engaged in the manufacture of honest olive oil to give them protection?

Chief Chemist WILEY. This is not a matter of principle, but of selfish gain. It is of sufficient magnitude to protect ourselves. This is the way I look at it.

The CHAIRMAN. You may state, if you please, Doctor, in your own way, the history and extent of the adulteration of foods which, in your opinion, are simply frauds upon the consumers and honest manufacturers, and not especially deleterious to health—any food products.

Chief Chemist WILEY. Those I have given above, of course, belong to that class, and there are many others. I may say that the condiments which we buy are nearly all adulterated by being mixed with some inert and harmless substance, which makes it possible to sell them at a very much reduced price, and yet they are sold largely as pure articles. I refer now to all kinds of condiments and spices. For instance, ground mustard, and peppers which are ground, and other spices and condiments. For instance, mustard has been suggested to me. This is so very often mixed with so much flour and turmeric, which gives it the yellow coloring similar to real mustard, that the quantity of pure mustard therein is almost a vanishing one. Just night before last I was using some ground mustard which looked very mild. I took half a teaspoonful and I could hardly get the least taste of mustard—there was only the least flavor of mustard in the whole mass. It consisted apparently of flour colored yellow with a little turmeric. This material as a flavoring matter is absolutely worthless, yet sold as pure mustard. You know no one could take a half a teaspoonful of mustard in the mouth with comfort. This is an illustration of what is practiced in condiments in general. It is very difficult to go at random into a store where these bodies are sold at the present time and purchase one which you can be certain is pure. Now the adulteration and mixing of these bodies with these matters I do not consider to be objectionable. In fact, many people prefer to have their condiments reduced in strength in this way. The fraudulent part is the selling of the mixed article for the pure, and getting the price which the pure article would bring. Another point which may be mentioned in this matter is, that where these bodies are not ground, where they still have their original shape, as, for instance, in the case of coffee, they may still be adulterated. Very extensive adulterations of the unground coffee berry have been practiced. A little molasses and flour colored to suit, whether you are going to mix it with the roasted berry or the green berry, is molded to resemble in shape the coffee berry. These artificial berries I have picked out of coffee purchased in the open market. As much as 25 per cent I have found to be artificial, but when mixed with the pure berries no one would notice the false ones in buying.

The CHAIRMAN. Is this so in the ground state?

Chief Chemist WILEY. Both ground and roasted; colored to suit.

The CHAIRMAN. You mean, they take this flour and molasses, or whatever it is, and mix it by a process and mold it so it looks like a coffee berry?

Chief Chemist WILEY. Yes. Brown and green, unburned and burned artificial coffee berries have been found.

The CHAIRMAN. Whereabouts in the market do you buy these?

Chief Chemist WILEY. In the Washington market. Where they were made I do not know. Of course, anyone closely examining the lots would see the difference, but a hasty buyer does not stop to make a microscopic or other examination of the materials they get at the stores. These would pass without exciting any suspicion.

The CHAIRMAN. So that in buying, the ordinary consumer, even though he goes to the trouble of buying coffee berries in the green, buying himself, is almost sure to be cheated?

Chief Chemist WILEY. Yes, sir; sometimes; but this adulteration

is not common. In regard to ground coffees, they are often adulterated with chicory. This is not injurious, and I, for one, rather like chicory mixed with coffee. It gives it body and richness of taste which the pure coffee does not have. In France, where they are celebrated for making good coffee, chicory is almost universally used in coffee. I object, however, to buying coffee for 40 cents a pound which is half or two-thirds chicory, which is worth only 8 cents a pound. I prefer buying the two separately and mixing them myself to suit my own taste. And so with this whole class of foods represented by coffee, spices, and condiments. Their adulterations have some natural justifications. The adulterations of this whole class of condiments and spices, including coffee and tea, are open, however, to this objection, that the innocent buyer who is not experienced is apt to be deceived in the matter. The adulteration of tea is not so common as that of the other members of the group.

The CHAIRMAN. I want to be a little more specific in this matter, and in order. Take pepper. Is that adulterated?

Chief Chemist WILEY. Yes, sir.

The CHAIRMAN. Is it adulterated before grinding or in the process of grinding?

Chief Chemist WILEY. I have never seen adulterated pepper before grinding.

The CHAIRMAN. The pepper berry, as far as your observation goes, is not adulterated?

Chief Chemist WILEY. It is not. If it is, I never have seen it.

The CHAIRMAN. But in the process of grinding or after it is ground it is common to adulterate it?

Chief Chemist WILEY. It is very common. I have a circular of what is called "fillers," which I can show the committee, consisting of ground inert matter colored to represent every form of spice and condiment that is on the market. These fillers are manufactured in large quantities and sold to dealers in spices and condiments, so that any desired color can be imitated.

The CHAIRMAN. Is that true as to pepper too?

Chief Chemist WILEY. All spices. I have a series of fillers manufactured by a firm which manufactures these fillers in large quantities, colored to imitate every form of spice on the market, so you can take your choice in mixing.

The CHAIRMAN. They simply manufacture adulterants, or mixtures for these spices, and sell to the trade?

Chief Chemist WILEY. Yes, sir.

The CHAIRMAN. Where is that firm?

Chief Chemist WILEY. I can not recollect, but I think it is in Kansas City.

The CHAIRMAN. Does that apply to cinnamon?

Chief Chemist WILEY. Yes. I do not think there is a spice that has not been adulterated in the ground state, or a condiment of any kind. I do not think one has ever escaped.

The CHAIRMAN. In this compound manufactured, what does the manufacturer use by way of adulteration?

Chief Chemist WILEY. Sometimes ground shells, like peanut shells. This makes a very good light brown. The mere grinding of these shells is sufficient. These are perfectly harmless, and cocoanut shells are harmless.

The CHAIRMAN. Even though peanut shells are harmless, you would not prescribe them for a workingman to eat?

Chief Chemist WILEY. No; I would rather give him the inside of the shell than the shell itself. Flour is also used as an adulterant, colored with various coloring materials, but turmeric more largely, perhaps, than any other substance. The manufacturers sell these products for what they are. The sale of these goods for what they are is perfectly legitimate. That is all we ask of them.

The CHAIRMAN. It is whatever they produce. The inspection of the product itself is the only way to prevent the consummation of a fraud on the public.

Chief Chemist WILEY. Yes. The manufacturer becomes *particeps criminis*, from a legal point of view, which I believe is objectionable to the court.

The CHAIRMAN. Did you say, Doctor, that you had a circular or advertisement or samples showing the manufacturing of these adulterants by this firm?

Chief Chemist WILEY. I have a full line of the materials which are furnished.

The CHAIRMAN. There is no written advertisement that you remember of?

Chief Chemist WILEY. Yes, I believe there is; but I have no copy.

The CHAIRMAN. Would you be willing to let the committee see these samples?

Chief Chemist WILEY. Undoubtedly. Yes; I would be pleased to furnish them.

The samples were subsequently produced, and consisted of the following specimens: (1) filler for allspice and cloves; (2) filler for black pepper; (3) filler for cayenne pepper; (4) filler for cinnamon; (5) filler for ginger; (6) filler for mustard; (7) filler for cream of tartar.

Chief Chemist WILEY. Fillers from 1 to 6, inclusive, consist of organic matter, ground shells of nuts, or flour colored to imitate the condiment for which it was intended. Filler No. 7, for cream of tartar, consists of infusorial earth.

The CHAIRMAN. Are there other forms of adulteration you have studied? For instance—.

Chief Chemist WILEY. Another form of adulteration which I have studied extensively in fermented beverages is the substitution of other bodies for malt in the manufacture of fermented beverages. Whether this can be regarded as an adulteration or not depends upon the point of view. There is a common impression to the effect that beer is an infusion made of malt and hops and subjected subsequently to fermentation. If that be the true definition of beer, then the substitution of any body or bodies for malt or for hops would be an adulteration. But this form of adulteration is practiced almost universally in this country, even by the largest brewers, in making the cheaper forms of beer, although a great deal of pure beer is made by the same people. But there is a demand for a cheaper beer, which leads the brewer to substitute for malt, barley, glucose, rice, and hominy grits. The latter are made from Indian corn. They are the more starchy portion of the grain, from which the hull and the kernel have been removed. The glucose or grape-sugar substitutes are made in all large glucose factories. And, in addition to these, rice is very commonly substituted for a portion of the malt where a very light beer, such as Pilsner, is desired; and most of all, the substitution of grape sugar is practiced for a very cheap beer. In no case is beer ever made without some malt, but the amount of substitution may reach as high as 60 or 70 per cent; that is, a low grade of beer can be made consisting of 30 per cent malt

and 70 per cent of this kind of substitution which I have just mentioned. Glucose or grape sugar is substituted because that requires no action of diastase to prepare it for fermentation. It is already in condition to ferment, whereas hominy grits or rice must first be acted upon by diastase or malt before it can be fermented. Therefore it requires more malt for hominy grits or rice than where grape sugar or glucose is used. Glucose is a term usually applied to the liquid products of the factory and grape sugar to the solid; and it is the latter substance which is always used in the brewery. In the manufacture of glucose or grape sugar the starch in this country is usually obtained from the grains of Indian corn, or maize. In Europe the potato is the source of the starch.

The CHAIRMAN. That, on the whole, Doctor, is not deleterious to health?

Chief Chemist WILEY. No, not necessarily; but the product is not pure beer.

The CHAIRMAN. But is simply the substitution of a cheaper for a dearer article in the manufacture of beer?

Chief Chemist WILEY. Yes, sir.

The CHAIRMAN. Then you say these same breweries manufacture a malt beer, or beer that is defined in the better acceptation of the term?

Chief Chemist WILEY. Most of them do. They make a pure beer, which they get a higher price for.

The CHAIRMAN. Is there any way that the ordinary layman, and not a professional man, who wants a glass of beer can tell the difference between a pure malt beer and a glucose beer?

Chief Chemist WILEY. I suppose the only way is to drink enough beer to become an expert. I do not know how a layman can tell. Pure malt beer has a better flavor, and to my mind is not so apt to produce acidity of the stomach or other digestive troubles.

The CHAIRMAN. As a matter of fact, Doctor, they are expected to sell this glucose beer cheaper than the malt beer?

Chief Chemist WILEY. Yes; cheaper than the pure malt beer. I will say this, Senator. I believe if you go to nine places out of ten where fermented beverages are sold you will get a substituted beer. There are certain brands of beer in the country—I do not want to mention any names, as this is not an advertising place—that are pure. If you will call for these you will get pure beer. I think I can tell, every time, a pure beer from a substituted beer.

The CHAIRMAN. You have during your experience analyzed these beers as a chemist?

Chief Chemist WILEY. Yes; and I can tell the difference, in most cases, upon analysis.

The CHAIRMAN. That has assisted you in being able to tell by the taste?

Chief Chemist WILEY. I should say that my analysis has been the principal test upon which I have relied.

The CHAIRMAN. But the ordinary consumer of beer—

Chief Chemist WILEY. Unless he is a connoisseur it would be almost impossible for him to tell except by chemical analysis, which requires apparatus and chemical skill to be of any value. I would not like to say that the making of rice beer, which is an excellent beer, and hominy-grit beer, which is an excellent beer—I would not like to say that the making of these was fraudulent; but from one point of view it is, if we regard beer as made of the pure materials mentioned. In regard to hops, so far as I know in this country the use of a hop substitute is

not practiced at all. I do not believe there is any reputable maker of beer who uses a substitute for hops. Some use cheaper hops, but practically all use hops. This is illustrated when I say that the price of hops ranges from 77 cents to 17 cents a pound. There is a difference in the character of the hops.

The CHAIRMAN. There is a difference?

Chief Chemist WILEY. Yes, sir. So you see you can use a very inferior kind of hops in a low-grade beer and very good hops in a high-grade beer.

The CHAIRMAN. Do you know personally of any practice of putting acid in barrels of beer for the purpose of preserving it?

Chief Chemist WILEY. That I will take up under the head of those adulterations which are injurious, but will answer now by saying that salicylic acid has sometimes been used for that purpose.

I would like to say something in regard to the materials used in a glucose factory and their use as foods. I have always found, from the time I first began to investigate food products, that the series of foods known as glucose or grape sugar, when properly made, are valuable food materials and not injurious. They are, however, to be used in their proper places and quantities, since it is certain that the consumption of too much of any one kind of food, even of a wholesome nature, may be injurious. The following are some of the principal foods produced in the manufacture of glucose: First, the substance known as glucose, which is a water colorless syrup of different degrees of density. For making table syrups and mixing in honey, etc., the glucoses are boiled until they have a density of from 41° to 42° Beaumé. When used for confectionery making the glucoses are boiled to a density of 45° Beaumé.

These glucoses consist of dextrin, a little maltose and dextrose, with a small per cent of other substances. When it is necessary to make a sugar for the use of brewers the starch from which the material is made is subjected to a higher degree of conversion, so that the residual product is almost entirely dextrose. Of this sugar various grades are made, according to the demands of the brewers. When dark beers are desired the sugars are a little colored, usually having caramel added to them to make them red. Where light beer is desired the sugars are almost white or quite so. These sugars are also made with various contents of water, sometimes having as high as 20 per cent water and at other times being almost anhydrous. I have seen as many as five different grades of sugar of this kind designed for brewers. In addition to this the by-products are very valuable, and are used mostly as cattle foods. There is a product which has lately come into prominence, and that is the oil which is extracted from the germ of the grain. This germ is separated and subjected to a great pressure, in the same way that cotton seed is treated for the expression of the oil. This corn oil is used for various purposes, and among others it is a partially drying oil and has been used to adulterate linseed oil. When treated with sulphur this oil becomes a highly elastic mass, and has been used as a substitute for india rubber. It is thus seen that the products of the glucose factory are important when used for the genuine articles of human food and are very valuable. The glucose factories make also a high grade of starch, which is finely ground, and has been extensively used under the name of "flourine," for mixing with the flour made from wheat. This mixture is now controlled by an internal-revenue law, which places a tax upon the mixed article. About the only products of the glucose factory which are not sold as a substitute for some human food are the by-products used for cattle food above mentioned.

The CHAIRMAN. What is a by-product?

Chief Chemist WILEY. It is the residue obtained after the first product in view has been secured, as, for instance, in starch manufacture, the hull of the grain—the bran, we call it; the more nitrogenous portion, which does not contain much starch, or none at all, and very little sugar. Another illustration is the cake which results from the extraction of the oil. This makes a very valuable cattle food. This cake, which is a residuum, is made by extracting the oil, and is also highly nutritious, and is quite as valuable as linseed or cotton cake. It is used for cattle food and for fertilizing purposes.

The CHAIRMAN. Let me divert your attention just a moment to the adulteration of linseed oil. I had supposed it was absolutely impossible to adulterate linseed oil. In adulterating linseed oil they use the oil of the germ?

Chief Chemist WILEY. Yes; they use the oil derived from the germ of the maize.

The CHAIRMAN. And it is extracted by pressure, the same as the cotton-seed oil?

Chief Chemist WILEY. The same; exactly.

The CHAIRMAN. What is this germ oil or corn oil worth, as compared with linseed oil? Which is the more valuable of the two, if bought separate?

Chief Chemist WILEY. Linseed oil is probably worth a great deal more.

The CHAIRMAN. So that the mixture is only a fraud upon the market?

Chief Chemist WILEY. Well, I think the mixture is injurious to the linseed oil. The mixture is less valuable and not of as good quality. The linseed oil is rendered very much less valuable.

The CHAIRMAN. That is, the mixed product.

Chief Chemist WILEY. Yes. Just the other day I was having my house painted. I said to the painter, "Is this pure linseed oil?" and he replied, "I do not think you can get a gallon of pure linseed oil in the market, but it is as good as we can get."

The CHAIRMAN. Could you, Doctor, if you had plenty of time and opportunity in your laboratory, detect the difference between the two oils?

Chief Chemist WILEY. Yes, sir.

The CHAIRMAN. And you would be willing to give us that time if the committee should ask for it?

Chief Chemist WILEY. Yes, sir.

The CHAIRMAN. You consider, as a matter of fact, that linseed oil or corn oil may be a food product; whether linseed oil is or not is quite another question?

Chief Chemist WILEY. Linseed oil is never used as a human food, but corn oil may be, for instance, as a salad oil.

The CHAIRMAN. I will take that up when there are more members of the committee present.

You were going on to state, now, other articles of food that are adulterated, which are not necessarily deleterious to health.

Chief Chemist WILEY. I might take up next the subject of jellies.

The CHAIRMAN. Yes.

Chief Chemist WILEY. The old-fashioned pure jelly has almost gone out of use in the trade. These jellies are still made by the housewife directly from the fruits, but when purchased at a store they are more commonly of other origin. The gelatin of commerce is employed largely, and the flavorings are artificial.

The CHAIRMAN. Now, as we go along, let me ask you to state to the

committee how this gelatin, which is an animal product—from what part of the animal is it produced, and how produced?

Chief Chemist WILEY. All animal tissues, I think, without an exception, contain the elements of gelatin. They exist especially in the cartilage bones and hoofs. Gelatin as such does not exist in these bodies, but a substance called collagen, a highly nutritious, nitrogenous product, which when heated in boiling water is converted into gelatin, and by heating the tendons and bones of animals, especially the tendons, the highest grade is obtained which is used in human food. The hoofs and rougher portion form gelatin, which is used as glue. Now, this is an entirely different substance from the jelly of fruit. The jelly of fruit belongs to the class of bodies known as pectin, and it is of the same family as sugar, and the same chemical centesimal composition as sugar. The gelatin of animals is a nitrogenous product and does not resemble in chemical composition the pectin or pectose of fruits. As far as the nutritive value is concerned the gelatin of animals is more valuable—has a higher nutritive value pound for pound. The gelatin in the artificial jellies simply gives the flexibility, the tenacity of the mass, while the color and flavor are made to imitate those of fruits. It is an artificial color and an artificial flavor, so that a great deal of the jellies now on sale, such as the wine jellies used as deserts, are absolutely innocent of having been derived from any kind of fruit whatever, with the possible exception of a dash of wine, and, of course, are much cheaper. As far as nutrition and wholesomeness is concerned I have nothing to say against them, but fraudulent in being much cheaper. Jellies are also largely made by utilizing the by-products of the apple-drying and cider-making industry, the parings, cores, and pomace, from which a certain amount of pectose bodies is obtained, which is fortified with glucose and flavored and colored to suit the taste.

The CHAIRMAN. Doctor, have you had your attention called to the class of cheap jellies which are being put upon the market now—how the fruit acid is being substituted by a very strong acid, the name of which I can not call at this moment?

Chief Chemist WILEY. I have not had my attention called to it.

The CHAIRMAN. Do you know what acid is used by way of substitution for the real?

Chief Chemist WILEY. Fruit acid is malic acid, but tartaric or citric acid is the one that would be substituted for such uses. Citric is the natural acid of lemons and oranges.

The CHAIRMAN. What kind is produced from salt?

Chief Chemist WILEY. Muriatic, or hydrochloric.

The CHAIRMAN. Do you consider that a proper thing to use in jelly?

Chief Chemist WILEY. I should not consider a small quantity injurious, because the acid which is produced in the stomach during digestion is always muriatic, and not an organic acid.

The CHAIRMAN. You feel that, as far as you have analyzed at the present time, there should be some law to prevent their marking their artificial fruit jellies as pure fruit jellies?

Chief Chemist WILEY. Undoubtedly.

The CHAIRMAN. Because it is a fraud upon the consumer, and it is unfair competition with the honest manufacturer?

Chief Chemist WILEY. And with the honest fruit growers. Both are valid arguments.

The CHAIRMAN. You say you will be willing to take some samples, which I will give you here, and analyze them for the benefit of the committee later on?

Chief Chemist WILEY. Yes, sir.

The CHAIRMAN. I have no disposition to expose any honest manufacturer, and I am not seeking to get any trade secrets, but I am informed that the carrying on of these various practices has cheapened the product, so that by the use of less gelatin and more of this very strong acid—I have forgotten the name of the acid—that they are able to make and put upon the market an article that is deleterious to health. I have been so informed. I want, however, to have you analyze some samples which I will give you, so that the committee may have the benefit of the actual analysis, as well as the opinion of people who come to talk to the committee.

Vinegar is a matter about which considerable complaint has been made to me as chairman of this committee, and if it meets with your approval, Doctor, I would like to have you take that up now.

Chief Chemist WILEY. I have studied vinegars extensively. We have right here a question of nomenclature which is rather important. In this country the common idea of vinegar is that it is made from fermented apple or fruit juice. In Europe no such idea attaches to the term "vinegar," as vinegar is made almost exclusively by the fermentation and oxidation of grains. There are three classes of vinegars in the market—cider vinegar, alcohol vinegar, and malt vinegar. Each one of these, it seems to me, should be designated by the class to which it belongs. Cider vinegar is preferred in this country to all others, and would, if properly protected, bring a higher price than all other vinegar. In the preparation of cider vinegar there is first a fermentation which converts the sugar into alcohol. Then we have hard cider. The next fermentation converts the alcohol into acetic acid. That is vinegar, and is combined with all the extract material which the cider vinegar contains. Malt vinegar is made in the first instance just like beer, except that when fermentation is completed it is subjected to further fermentation in which the alcohol is converted into acetic acid. The acid principle is the same as in cider vinegar, but the extract with which it is associated is entirely different. It is the extract of the grain of whatever kind used. Wheat and rye and Indian corn may be used, but in this case we have no malic acid, but we have those acids due to fermentation or peculiar to the grain. I should consider both of these products, therefore, as legitimate forms of vinegar. We have in this country an immense quantity of still another form of vinegar, which is made by oxidizing the low wines of the distillery. This is a fermentation in which alcohol is converted into acetic acid. This is done by allowing the low wines to trickle over beech shavings and in this condition the oxidation goes on with great rapidity, so that low wines running into the top and trickling over beech shavings come out acetic acid. There we have a vinegar which has scarcely anything in it at all but just acid and water. This vinegar is artificially colored, and probably a little dextrine or some other substance put in to give it body, and is sold as pure vinegar. You can not tell. You go to your table to day and pick up the vinegar, and you can not tell what you are getting. The chances are it is not cider vinegar.

The CHAIRMAN. Cider vinegar is more valuable?

Chief Chemist WILEY. Yes, sir.

The CHAIRMAN. And more universally demanded in this country?

Chief Chemist WILEY. Yes, sir.

The CHAIRMAN. And if it was properly protected there would be a greater demand, and it would probably bring a better price to the honest manufacturer—the men who raise the apples and make the cider.

Chief Chemist WILEY. Yes, sir.

The CHAIRMAN. The malt vinegar you say is cheaper vinegar, but not necessarily deleterious to health?

Chief Chemist WILEY. Yes, cheaper, but not at all deleterious, yet not as palatable as cider vinegar.

The CHAIRMAN. But the acid vinegar which is made—or the alcohol vinegar, rather, which is made by the dripping of the low wines over beech shavings, produces acetic acid, which, being diluted by water, and by using something to give it body, and colored, is sold for real vinegar?

Chief Chemist WILEY. Yes, sir.

The CHAIRMAN. Is that manufactured to a large extent?

Chief Chemist WILEY. Yes, sir; very largely, and probably has more sale in this country than all other kinds put together.

The CHAIRMAN. Do you consider it healthy?

Chief Chemist WILEY. Yes, sir; all of these vinegars are wholesome, but the flavor is not as good as the flavor of the apple; the cider gives it a better flavor. You get an artificial flavor in the low-wine product. All I would ask in the law is that all vinegars should be sold under their proper names; cider vinegar, malt vinegar, and low-wine vinegar, that being the order of their value, the low-wine vinegar being the cheapest.

The CHAIRMAN. Do you know of any other way of manufacturing vinegar, either general or special?

Chief Chemist WILEY. I do not think of any other way in practice. There may be, but of no commercial value.

The CHAIRMAN. You would not consider that the vinegar made from the low wines and made into acid by dripping through beech shavings—if a person was accustomed to using large quantities of vinegar—you would not consider it beneficial to health?

Chief Chemist WILEY. I would not say it was injurious to health. It is only used as a condiment and for pickling. I would not consider it injurious to health in very small quantities.

The CHAIRMAN. But you do say that it ought not to be allowed to be sold in competition with honest cider vinegar which would bring a much higher price—higher price by reason of the demand, and by reason of its flavor?

Chief Chemist WILEY. Pure cider vinegar merits a higher price.

The CHAIRMAN. Well, I will ask you to state what is your experience and observation in regard to the adulteration of pickles?

Chief Chemist WILEY. Well, I never made any special investigation of pickles. What I would say would be perhaps regarding the use of vinegar and other condiments which are commonly sold as vinegar, and which are important ingredients in the making of pickles of commerce. We have pickled fruits of all kinds. We have cinnamon and cloves used for pickling. I imagine you refer to vinegar pickles.

The CHAIRMAN. Yes, sir.

Chief Chemist WILEY. Of course the large manufacturers would use the cheaper vinegar, and of course they would not use any coloring—simply the clear low-wine vinegar. They would not want to use a drop of coloring matter in vinegar because it would interfere with the natural color of the pickles. When you come to the other part of the subject I may refer to the use of zinc or copper in making pickles, but that would come under the head of deleterious substances. I do not see any objection to the use of low-wine vinegar in pickling.

The committee adjourned

MAY 3, 1899.

The committee met at 3 p. m.

Present, Senator MASON (chairman) and Dr. H. W. WILEY, Chief Chemist, Department of Agriculture.

Mr. BERNARD A. ECKERT appeared.

STATEMENT OF MR. BERNARD A. ECKERT.

The CHAIRMAN. What is your name, residence, and occupation?

Mr. ECKERT. Bernard A. Eckert; I am president of the Eckert-Swan Milling Company.

The CHAIRMAN. Are you a member of the organization known as the National Board of Trade?

Mr. ECKERT. I have been a delegate to the National Board of Trade from the Chicago Board of Trade.

The CHAIRMAN. You are a member of the Chieago Board of Trade?

Mr. ECKERT. Yes, sir.

The CHAIRMAN. Your business is that of the Eckert-Swan Milling Company, engaged in the manufacture of flour?

Mr. ECKERT. Yes, sir.

The CHAIRMAN. Have you in the last few years had experience in the manufacture of flour—in competing with the sale of flour—which was sold as wheat flour, but which, as a matter of fact, was not wheat flour?

Mr. ECKERT. Yes, sir.

The CHAIRMAN. Did your firm have any of the kind of flour to compete with?

Mr. ECKERT. Yes, we had that kind of flour to compete with up to the time that the pure-flour bill—so called—was passed and went into effect.

The CHAIRMAN. I would like to have you state for the benefit of the committee what effect that bill has had—known as the pure-flour bill—upon the sale of pure flour, from the manufacturer's standpoint.

Mr. ECKERT. The immediate effect, and I believe the last effect, is this, that while prior to the enactment of this law by Congress—I will go back, say, two or three years prior to that time—many millers, as well as dealers in flour, mixed foreign substances with wheat flour and sold it for pure flour—sold it under their regular brands. It was done not only by the millers, but by the flour dealers, who had machinery in their establishments for mixing it; and while in many instances it was mixed with foreign substances that were not deleterious, yet it was in the nature of a commercial fraud upon the public. It was sold as pure flour, when it contained cheaper ingredients that were not worth near as much as pure wheat flour. It was not only injuring the honest millers in this country and perpetrating a fraud upon the consumer, but it also began to militate against the American millers. Shipments of flour had been inspected in other countries and found to contain foreign substances and rejected, and they began to feel that the American millers were adulterating their flour, and they were agitating the question of making laws to exclude the American-manufactured flour, or at least adopt a rigid system of inspection, so that ultimately it might affect seriously and materially the amount of flour we ought to export to foreign countries. I might say in this connection that in 1896 we exported about 10,000,000 barrels from this country, and since the law went into effect, and since

the people on the other side have been reassured that our flour was pure, our exports have been very large. In fact, we have reason to believe that this year our export of American-manufactured flour will exceed 15,000,000 barrels.

The CHAIRMAN. That will be an increase of 5,000,000 barrels, won't it, between the year 1896 and this?

Mr. ECKERT. Yes, sir. It may all be due to this cause, but I think some of it is due to the fact that the people feel that there is a Government supervision over the American-manufactured flour, and that whatever they use for wheat flour is wheat flour, and pure, unless otherwise labeled.

The CHAIRMAN. Have you had any correspondence with the people to whom you export flour, expressing any opinion?

Mr. ECKERT. Yes; we have received letters from some of our correspondents in which they say that they are very much gratified because Congress had enacted such a law, and they are now expressing themselves as well pleased that they can purchase American-manufactured flour with the assurance that it will be pure wheat flour.

The CHAIRMAN. Well, then, do you feel, Mr. Eckert, that if the present law is thoroughly and legally enforced, that it will give protection to the honest manufacturer, protect our consumers, and also be the proper recommendation for our export trade?

Mr. ECKERT. I do. I think it is an excellent law.

The CHAIRMAN. Have you any suggestions as to amendments in any way?

Mr. ECKERT. Well, there will be only minor amendments. I do not know as I am prepared at this time to suggest any amendments. I believe the law ought to remain upon the statute books, with, perhaps, the few slight amendments, to exclude, possibly, baking powder that is put up in small packages.

The CHAIRMAN. There have been some requests from people who mix what is called "self-rising flour."

Mr. ECKERT. Well, I am not prepared to make any suggestions. You say that the law ought to be made so as to let them out. It might lead to the abuse of the law. They might put up flour in packages and call it self-rising flour, and in that way impose upon the public. However, I am not prepared now to say definitely.

The CHAIRMAN. I will say to you for the committee that if it occurs to you that there are any hardships that can be remedied by amendment, the matter will be taken up for discussion during the pendency of the next attempt to amend the war-revenue act; and if you have any suggestions to make, the committee will be very glad to have it put in the shape of a letter and have it embodied in your testimony.

Mr. ECKERT. I think that to-day every honest miller and every honest dealer in this land feels that this law has accomplished what was sought to accomplish. When the bill was introduced I felt that the American people—

The CHAIRMAN. And it certainly is not a hardship upon anyone to mark their flour for what it is?

Mr. ECKERT. No, sir. It is required now that when they mix wheat flour with some other substances it ought to be labeled, so that the consumer will know just exactly what he eats. I do not know of any act that has given as general satisfaction, as far as I can learn, as the pure-food law.

Chief Chemist WILEY. Do you think there is any surreptitious mixing of this flour going on now—where the law is disregarded entirely?

Mr. ECKERT. I have not heard of any such thing. It might possibly be. I have not heard any complaint at all. Well, Doctor, an expert for the Government testified that there had been a shipment of 10,000 barrels of flour which had been surreptitiously mixed by a company in North Carolina, which was made of mineraline, which is another name for teriana.

Chief Chemist WILEY. The good effect is due to the publicity?

Mr. ECKERT. The good effect is due to the fact that the law imposes upon the people mixing flour that they brand it under the penalty attached.

Chief Chemist WILEY. So that the tax does not cut much figure?

Mr. ECKERT. The tax cuts no figure at all. It is the fact that what they do is made public rather than the tax that is required to be paid.

STATEMENT OF CHIEF CHEMIST WILEY—Recalled.

The CHAIRMAN. At the time of the adjournment this morning you had enumerated quite a number of articles which were merely considered fraudulent and not of necessity deleterious to the public health. Do you now at this moment recall any others of that class which you did not mention this morning?

Chief Chemist WILEY. Well, I did not begin, of course, to cover the whole range of adulteration. I only mentioned types which cover pretty well the whole.

The CHAIRMAN. I would like to direct your attention to the question of sirups. You have had occasion to chemically analyze sirups?

Chief Chemist WILEY. Yes. The manufacture of table sirups is one which engages quite a large capital in this country and is quite an important business. The old-fashioned table sirups were made directly from the maple tree, sugar cane, or sorghum without admixture. Then gradually the custom came into vogue of using the molasses that comes from the preparation of sugar as table sirups—that is, the juices were boiled first to get the pure sugar crystallized; then these were put into a hogshead to drain or into a centrifugal, and the molasses therefrom became a very common article of table sirups. For instance, the old-fashioned, open-kettle method was used in the manufacture of a very fine table sirup, using the sugar-cane juice, which was boiled in an open kettle, and the sirup set aside until crystallized and the whole put in hogsheads with perforated bottoms, a little straw being laid over the bottom to stop the holes and retain the sugar. The hogshead was placed in an upright position, and in a few days or weeks the molasses would run out by gravity, making a most excellent article of table sirup. The small farmer formerly made an immense quantity of sirup from sorghum by boiling the juice down and converting it into molasses. But other large quantities were made from the maple orchard, which was the old-fashioned, genuine maple molasses or sirup. Soon, however, a number of artificial processes came into vogue, so that a large number of the sirups were made from glucose, the glucose being artificially colored by mixing with highly colored sugarhouse molasses, as the common idea of sirup is that it is of a yellow or amber color. It therefore became necessary to color the glucose, and for this purpose the refuse of sugar refineries was employed very largely, so that 5 gallons of refuse and 45 gallons of glucose would make a barrel of table sirup having a slightly amber color and the flavor of the sugar sirup to a great extent. This very

common article of sirup was sold the country over, and is still, and often sold under fancy names.

The CHAIRMAN. Under fancy names?

Chief Chemist WILEY. Yes; as "Golden Drip" and "Honey Drip" and "Honey Sirup," and a dozen different names. I never heard of its being sold under the name of glucose or mixed glucose, and the people imagine they are getting a high grade of sugar-cane sirup, when in fact they are getting a very low grade of molasses, which could not be made into anything else. These goods are sold at fancy prices. A clear sirup with a light amber tint will always bring a higher price, no matter what it is made of. The high price of maple sirup leads to its artificial fabrication, and artificial maple sirup resembling the real is used to a more or less extent in this country. The common method of making artificial maple sirup in this country is to mix it with glucose or, better, with melted brown sugar. Maple sirups are very limpid, and the addition of glucose is apt to make them sticky. The manufacturers melt a yellow sugar from the refineries which gives a degree of thinness like maple sirup. This is flavored with an extract of hickory bark or some similar substance, which gives it a flavor similar to the maple flavor, and thousands of barrels of "Pure Vermont maple sirup" have been made at Davenport, Iowa, and other localities where a maple tree never grew, except when planted upon the street. These artificial sirups are sold extensively in this country, and the farther you get from Vermont the cheaper and more abundant they become.

The CHAIRMAN. Have these extracts of hickory bark—so you consider this healthy and good for the system?

Chief Chemist WILEY. I do not think them deleterious.

The CHAIRMAN. When used in such small quantities?

Chief Chemist WILEY. Yes; the flavors of the maple sirups are sometimes similar to that which exists in hickory bark, but this flavoring substance is not a sugar. The value of the maple sirup is not alone in the sugar it contains, but in this peculiar flavoring substance, such as the chemists call an "ether," which exists in minute quantities and gives that flavor and odor which the people are willing to pay their money for. It is the flavoring matter which makes the price. No one ever heard of refined maple sirup. Refining would take from it the flavoring matter and diminish its price.

The CHAIRMAN. Do they adulterate the solid cakes of maple sugar?

Chief Chemist WILEY. Yes; that is also done very extensively. The yellow sugar from the refineries is melted in. I have no personal knowledge of this and can not say positively, but this fact can be established when the committee sits in Boston, where the dealers in maple sugar can be brought before the committee. The practice, however, of adulterating in Vermont is not very extensive. The farmers there, and I have personal knowledge, are mostly perfectly honest and sell the genuine article; but there is no doubt of the fact that there are mixers even in the State of Vermont, where these adulterants are put in. Even the chemist is not useful in this case, since the amount of flavoring matter is so small that it can not be estimated by chemical means. The chemist is practically helpless.

The CHAIRMAN. Before it is put in the mold it has to be crystallized?

Chief Chemist WILEY. The maple sugar is boiled until it gets ready for crystallization, then it is poured into a mold, where it solidifies and crystallizes. If you would pass this material through

boneblack you would have ordinary sugar, which you would have to sell for about 4½ cents a pound. If you leave it in the raw state you can get 8 or 10 cents a pound for it. Now, in regard to the nutritive value and wholesomeness of these table sirups I have no criticism to make at all. Only a general law which would operate, as the last witness has said, requiring publicity, would secure perfect indemnity from fraud, and would have the same effect as the law regarding mixed flour.

The CHAIRMAN. Have you in the course of your experience analyzed any confectionery?

Chief Chemist WILEY. Very extensively.

The CHAIRMAN. I wish you would state for the benefit of the committee the chemical history of confectionery in the United States, what it is composed of, and give general remarks concerning it, as you have of other manufactured products.

Chief Chemist WILEY. Perhaps a general answer to that question would include almost every known substance, because there is no definition of pure confectionery. A confection is what the manufacturers choose to make it. They use sugar in all confectionery, because the sweet taste is what makes it confectionery. The sugar, when used, is almost always, I think, reasonably pure and wholesome, but sugar alone would make only a brittle confectionery, and that is not desired in all cases. It is necessary often that it be soft and waxy, or have any other property that the trade might demand, and hence the manufacturers strive to meet the demand. For instance, a confection like the marshmallow would naturally contain glucose, gelatin, and often flour to give it the consistency and color desired, and flavoring is added to give it the peculiar flavor and odor. And the caramels, of which several kinds are made, require burnt sugar. Some contain chocolate, and some also contain glucose, and sometimes flour or starch, which latter is preferred often to flour as being freer from protein substances; also flavoring matter, containing various chemical substances. The use of an impious coloring matter is also very important. Some people prefer white candy. When I was a small boy my idea of beauty and happiness was a stick of candy seasoned with cinnamon and with a red stripe running around it like a barber pole. In fact, coloring in confectionery appeals as much to the individual's own taste as to anything else, so that the manufacturers of confectionery have studied the aesthetic part, and some of the most pleasing tints have been incorporated in confectionery, appealing to the eye as well as to the taste. I have made a very careful investigation of these coloring matters. Occasionally poisonous ones are used, but since publicity was first given to the matter, some ten years ago, this evil has been mitigated, and I doubt if you can find a single poisonous material used at the present time.

A coloring of aniline dye or of some harmless vegetable substance is used.

There is no necessity for a dealer in confectionery to use a poisonous dye, because he can get the tint desired with a perfectly harmless one, and the difference is very minute from a financial standpoint. Mineral coloring has been almost tabooed. Chromate of lead has been employed to give a yellow tint. This has gone out of use now, and out of about 100 kinds of colored confectionery which I examined in my laboratory I only found 2 of mineral origin. All the rest were of animal or vegetable origin, and none of them poisonous. Now, as to the mineral ones. I do not know that the use of mineral matter

for coloring is practiced at all to any extent in confectionery. The manufacturers of confectionery have been very successful in securing harmless material. I think very few of the coloring materials used will prove injurious when used in small quantities. I think you will find the National Confectioners' Association ready to aid you in every way to secure a law which would forbid the use of any injurious coloring materials in confectionery. The starch, the glucose, the sugar, the flour, the chocolate, the burnt sugar, and the gelatins which are used in confectionery are certainly not to be condemned, but the use of terra alba or other mineral matters in small quantities, even if not poisonous, are to be condemned. They are much more injurious than substances of vegetable origin I have mentioned, especially to children. There is a natural taste, especially in young children, for these sweeter materials, and those of vegetable origin should be used because they aid in the growth of the body. They furnish the heat and the adipose tissue. The idea that sugar should be condemned is erroneous. These sweets are actually nutritious. Late experiments made in the German army showed that sugar was useful as a ration. Where soldiers are to live two or three days on small rations and endure the strain of a hard march, little pellets of sugar can be carried in the pocket and serve to keep up strength and are an aid to health. They are nutritious when used even in small quantities. There is one habit indulged in by some confectioners which should be prohibited by law, and that is the mixing of alcoholic material with confectionery.

I have had occasion to examine gum drops and other materials in which a drop of brandy or alcohol was mixed in, and by breaking it open one could detect it. That is extremely reprehensible, especially for children. The flavoring materials used in confections are of vegetable and synthetical origin. Some of the ethereal oils are used in small quantities as flavoring; for instance, the oils of cinnamon and cloves. These in minute quantities are not injurious. The chemist also furnishes large quantities of synthetic flavoring bodies. These, as made by the chemist, resemble or are almost identical with those flavoring materials occurring in fruits and flowers. Those occurring in nature are made by nature and the others are made by chemists, and actually in some cases can be made much cheaper. The chemist can make them so cheaply that these flavorings are supplanting the natural ones. It seems to me that where artificial flavorings are employed the consumer should know it, because there are stomachs that are very delicate and are injured by the artificial product, although the chemicals seem to be identical with the natural ones, so that to protect idiosyncrasies of this kind and in justice to the natural extracts as well as to the synthetic ones it seems only fair that the whole truth in regard to them should be known.

The CHAIRMAN. I want to ask you about this substance known as terra alba. What do you mean by it, Doctor?

Chief Chemist WILEY. Terra alba is a term applied to a number of white mineral products. The term itself is Latin, and means "white earth."

The CHAIRMAN. That is used largely, is it not, in confectionery?

Chief Chemist WILEY. Yes; it has been, and perhaps still is in some cases. That is the reason that I said that all mineral materials should be forbidden. It is used instead of starch and to increase weight.

The CHAIRMAN. It adds to its weight?

Chief Chemist WILEY. Yes, sir. It has also been used in the adulteration of flour. Lately in North Carolina a factory has been operated in producing this terra alba. Any white earth may be called terra alba; for instance, kaolin, which is a perfectly white clay.

The CHAIRMAN. Did you ever have submitted to you the product of this factory that you spoke of, known as mineraline?

Chief Chemist WILEY. Yes; I referred to that. I have samples now, both ground and unground.

The CHAIRMAN. That is absolutely insoluble in the stomach?

Chief Chemist WILEY. Yes, sir; undoubtedly so. It serves as a mechanical impediment and is injurious to that extent. It loads the stomach up with a dead weight.

The CHAIRMAN. Have you observed in your analyses the use of barytes?

Chief Chemist WILEY. It is also sold as terra alba. It is known as sulphate of barium. It is very heavy and of high specific gravity, so that a given amount of it will weigh more than any other white earth that is known. I have never found it in a food product, but it is used largely in adulterating paints.

The CHAIRMAN. To use plain language, what is it?

Chief Chemist WILEY. It is a compound of barium and sulphuric acid.

The CHAIRMAN. Is it ground stone?

Chief Chemist WILEY. Yes; it is a stone—a mineral which makes a perfectly white powder, absolutely insoluble, even in the strongest acid. You could not dissolve it in muriatic acid.

The CHAIRMAN. You have applied the test, so that you know that this barytes is insoluble in the strongest acid?

Chief Chemist WILEY. Yes, sir; the only way to dissolve it is to fuse it in a white heat with caustic alkalies. It is very similar to terra alba, that being the generic term for all kinds of white fine-ground minerals.

There is another thing that has been used in flour which is also perfectly white, and it is also used in confectionery.

The CHAIRMAN. What is that?

Chief Chemist WILEY. It is sulphate of lime. Barytes is sulphate of barium and gypsum is sulphate of lime; and when ground makes a perfectly white powder that is partially soluble in water and dilute acid and is used in confectionery and also as an adulterant in flour.

The CHAIRMAN. Now, you have mentioned the use of mineral dyes and barytes, terra alba and mineraline, and alcohol. Do you know of any other special ingredients that are used for the adulteration of confectionery?

Chief Chemist WILEY. No; I know of none.

The CHAIRMAN. You think you have named all?

Chief Chemist WILEY. Practically all have been mentioned.

The CHAIRMAN. You have named those which you consider commercial deceits and those which are deleterious to health?

Chief Chemist WILEY. Yes; I have mentioned both.

The CHAIRMAN. And now, to epitomize, I understood you to say that mineral and some aniline dyes were deleterious to health; that mineraline, terra alba in all forms, and alcohol should be excluded from confectionery.

Chief Chemist WILEY. Yes, for the reasons I have stated.

The committee adjourned.

THURSDAY, May 4, 1899.

The committee met at 10 a. m.

Present, Senator MASON (chairman) and Chief Chemist WILEY.
Mr. I. GILES LEWIS appeared.

STATEMENTS OF MR. I. GILES LEWIS,

Who, being first duly sworn, testified as follows:

The CHAIRMAN. What is your business, Mr. Lewis.

Mr. LEWIS. I am a wholesale druggist, at 92 Lake street.

The CHAIRMAN. Mr. Lewis, I have asked you to come before this committee to answer some general questions in regard to food adulterations, because I have been informed that you have made this matter a study for years, and I desire to get the benefit of your experience, and I will ask for some suggestions from you as to the national pure-food law. You say that you know that food is adulterated. What is the object of the adulteration of food?

Mr. LEWIS. The object of the adulteration of food is to enhance its value by giving it a semblance of what it is not.

The CHAIRMAN. This resolution that has been passed by the Senate recites that there are certain classes of adulterations which are simply frauds upon the consumer, and another class which are not simply frauds, but are deleterious to health. What have you to say about this?

Mr. LEWIS. Well, you have stated that there are two classes of adulterations. One is to give the food an appearance that will add to its value, like the coloring of butter and cheese, and the adding of harmless coloring matter to various kinds of liquors by using that sort which the generally accepted taste of the community seems to demand. These adulterations are harmless and to a certain extent beneficial, because they please the eye and in that way satisfy in a general way the people. The other class of adulterations are used to sophisticate the product and give it a fictitious value. This sophistication may be divided into two heads—the adulterations which are themselves injurious, and the adulterations which are used which are in themselves inert. I might define that more clearly, perhaps. The addition of sulphuric acid to vinegar would be injurious. The addition of a pure quality of material of what we call "spent" spices, which have their sense of oil taken out, or buckwheat hulls, which have a semblance of pepper—these in themselves are inert. I mean by that harmless.

The CHAIRMAN. You mean harmless?

Mr. LEWIS. Yes. They have no virtue in themselves, but they increase the bulk and weight of the material adulterated, and in that way give it the appearance of value which it does not possess.

The CHAIRMAN. Mr. Lewis, you have given some thought and attention to the preserving of foods. You know generally about it?

Mr. LEWIS. Yes.

The CHAIRMAN. Please state for the benefit of the committee whether in the preservation of foods there are any adulterants used, either inert or harmful.

Mr. LEWIS. There are four general ways of preserving foods. The first is by heat, embracing roasting or in any way raising the temperature so as to keep the particles of food from acting upon each other; the second is by cold, which accomplishes this same purpose in an

opposite way; the third is by drying, which produces the same result by excluding the water; andt he fourth, which is the general subject under consideration, is by the addition of some substance in liquid form which accomplishes this result.

The CHAIRMAN. Then I understand you to say, or do you say, that there are preservatives that may be used which are harmless?

Mr. LEWIS. Yes. The general rule laid down is this: Anything that is used for the preserving of foods which itself enters into the animal economy is a harmless preservative, as it is absorbed at the same time that the food is digested. The ordinary materials for this purpose are alcohol, sugar, salt, and vinegar. Now, salt and certain condiments like pepper and other spices do not come under the general rule, but they have by custom become articles of general use, and are an exception to the rule because they promote the absorption of the food by increasing the flow of digestive fermentation, and while they may be harmful in large quantities, in the way in which they are used they are really beneficial.

The CHAIRMAN. You have examined, as I understand, Mr. Lewis, the laws of other countries upon the subject of food adulteration and know in a general way what is restricted as far as the use of antiseptics is concerned. Will you give that for the benefit of the committee?

Mr. LEWIS. Well, the general unprinted law is substantially to exclude anything from use in preserving foods which I have not already mentioned, and in some countries—Germany and France, for instance—these laws are very stringent and make it a penal offense for any violation, because they regard the matter of pure food for the people as one of prime importance.

The CHAIRMAN. Do you know of any country in the world except our own—that is, any civilized country—that does not have some general law for the protection of the consumer?

Mr. LEWIS. I have not looked into any except the general laws of France and Germany. The other countries follow in their wake usually. They have given the most attention to it.

The CHAIRMAN. For the benefit of the committee, which one of the general laws do you consider the best to protect the honest manufacturer and at the same time protect the consumer when he goes to buy, so that in buying he gets what he pays for?

Mr. LEWIS. The English law is unquestionably the best food law, because the English law makes the provisions general, not only for the food to be consumed at home but for food for export. The German laws and the French laws make an exception in the preparation of food from materials which are exported and allow antiseptics to go to foreign countries which would not be allowed to be used at home.

The CHAIRMAN. Then I understand you to say that we are receiving into this country to-day manufactured goods, food products, from foreign countries which could not be sold in their own country?

Mr. LEWIS. Yes; this is especially noticeable in cheap German wines and French wines and all products which are not of the high class and bottled and prepared at home. This is particularly noticeable in low-grade products, which are usually sold to the poor. The high-grade products, which the rich pay any price for, of course, are guaranteed by trade-marks, etc., and it would not be any object for the people who produce them to put any antiseptics in them. These antiseptics have become a very close study, as most of them are very difficult to determine.

The CHAIRMAN. I understand, then, that, for instance, Germany can

sell, without let or hindrance, in this country certain articles of food products that her people could not sell in her own country, and as a rule it is a cheaper grade of these products, like a cheap wine?

Mr. LEWIS. Cheap wine and beer. Germans are very particular about the quality of their beer. It seems to be almost necessary in passing through the Tropics that those products which have very little alcohol in them should have some other preservative in them to keep them. While the German Government would not allow these at home, they would allow them to be used abroad.

The CHAIRMAN. Does the English law protect the English people against that sort of thing?

Mr. LEWIS. Yes; it does. It in a way corrects this way of doing. It compels the manufacturer to put upon his labels exactly what the articles contain, and in this way the law rather oversteps itself, because many of the things which a manufacturer might hesitate to put on his formula onto the packages, as some little inert substances, might give character to his preparation which might be injurious to his business. For instance, the preparation of mustard. In England, under this law, Coleman, who makes the best mustard, undoubtedly, in the world, was compelled to put on his high-grade mustard that it contained flour, which was absolutely necessary to preserve the mustard and insure its delicate flavor when put in water.

The CHAIRMAN. In other words, the flour was really put in to preserve the mustard and prevent the loss of flavor, but, being a foreign substance, under the English law he has to mark it "mixed" or "adulterated?"

Mr. LEWIS. Yes, sir.

The CHAIRMAN. From your commercial study and learning, which do you think is the best law?

Mr. LEWIS. The English law, by all means.

The CHAIRMAN. In what way do they compel the marking of their goods?

Mr. LEWIS. Well, every label must truthfully represent what the package contains in a general way.

The CHAIRMAN. Is the law enforced?

Mr. LEWIS. That I can not say. I have never looked into that part of it.

The CHAIRMAN. Do they have a special food commission?

Mr. LEWIS. I think it is one of the departments of the Government. That I have not looked into. That is the legal part of it, which does not concern me.

The CHAIRMAN. I want just general information.

Mr. LEWIS. That comes in the legal department of the Government.

The CHAIRMAN. Do they require the stamping by revenue stamps of any food products?

Mr. LEWIS. No, sir.

The CHAIRMAN. They raise no revenue, as you understand?

Mr. LEWIS. No, sir.

The CHAIRMAN. Does the Government issue any sort of a certificate?

Mr. LEWIS. No.

The CHAIRMAN. Just a police regulation?

Mr. LEWIS. Yes. That is where the English Government, when viewed from our standpoint, is rather lame, because the English people do not as a rule export foods. They export manufactured articles rather than foods. Their principal export of foods is condiments.

The CHAIRMAN. You have given the matter a great deal of thought. Do you favor a national pure-food law?

Mr. LEWIS. Yes, sir; I think it is of great importance if properly drawn up. I should not favor a national pure-food law along the general lines of the State food laws which we have.

The CHAIRMAN. Have you examined the State law of Illinois?

Mr. LEWIS. Yes, sir; not as closely as I have the other laws. I understand it is modeled after the other State laws.

The CHAIRMAN. This is true, that a manufacturer, say, at Chicago, is liable to ship one article into one State which would be acceptable under the State law, say, of Michigan, and wholly unacceptable in the State of Iowa?

Mr. LEWIS. Yes; many manufacturers to a great extent prepare their products so as to meet the requirements of the laws of the several States.

The CHAIRMAN. The Government of the United States now has no national law affecting the manufacture of pure food, except in so far as it applies to cheese and butter and flour?

Mr. LEWIS. Yes.

The CHAIRMAN. And you understand, do you, the general provisions of these laws?

Mr. LEWIS. Yes, sir.

The CHAIRMAN. It compels the manufacturers of oleomargarine to put on revenue stamps and it is under the control of the Government, and the same way with mixed flour which has heretofore been sold as wheat flour?

Mr. LEWIS. Yes, sir.

The CHAIRMAN. Have you any suggestions to make to the committee as to a general pure-food law?

Mr. LEWIS. Well, I feel that the object of the pure-food law is two-fold. It is to prevent the marketing of anything as an article of food which will be injurious to the people, and to punish anything of this sort, if necessary, in order to accomplish this result. On the other hand, the better object of a pure-food law, it seems to me, would be to make it an inducement for the manufacturer to raise his standard to such a grade that the food would be acceptable not only here but in any part of the world.

The CHAIRMAN. How would you encourage the manufacturers to do that, and what inducements would you offer as a matter of law to have that done?

Mr. LEWIS. Well, as I said in the first place, there are harmful and harmless adulterants. Now, to what extent an adulterant can be harmful, where the line should be drawn when it is harmful in materials, can not be fixed by a regular law, but should be determined by a regular commission of people versed on such subjects. For instance, there can certainly be no harm in using small quantities of alum to make cucumber pickles hard, and in that way keep it in a proper state before it is consumed. At the same time there will certainly be a great harm in allowing alum to be used as a preservative in pickling instead of salted vinegar. A point like this should be determined by a commission. When corn, for instance, is put up in a can in its natural state it might be necessary to use a slight amount of antiseptic in the beginning, so as to prevent that corn from souring in the can, and while that antiseptic itself is not necessary it is more desirable than to have corn sour before it is eaten, and to just what extent these things should be used should be determined by intelligent people, our object

being to raise the standard in foods and make them acceptable and palatable when they reach the consumer.

The CHAIRMAN. In what way would you suggest to give the consumer notice as to what he is buying? You spoke, for instance, of alum; you would not object to having anything preserved in alum. Your point is based upon the accepted theory that alum is deleterious to health. Now, how would you give notice that it was there, and how would you give notice to the consumer that it was not there?

Mr. LEWIS. I hardly think that is necessary. If there is sufficient confidence in the commission that took that thing in charge it would hardly be necessary to go into particulars. They are used in such small quantities the whole does not cut any figure. At the same time, under the strict interpretation of the law, a small quantity would cut as much figure as a large quantity.

The CHAIRMAN. There are other articles of food. Take baking powder. Large quantities of alum are used in baking powder. Is that, in your opinion, deleterious to health?

Mr. LEWIS. Certainly so.

The CHAIRMAN. You think that is true. How would you as a consumer, under the suggestions you make, know which is an alum baking powder and which was a pure cream of tartar baking powder, for instance?

Mr. LEWIS. If alum is an integral part of the baking powder, it certainly should be so labeled, and I hardly think the food commission would give it its sanction.

The CHAIRMAN. Do you mean to take the can, and by having a Government employee know what is put in, certify to it?

Mr. LEWIS. Yes, certainly. To know what is put in. We were speaking of alum. If the commission should decide that alum was deleterious to health, then the Government could not give its guaranty to a package as being one which was pure food.

The CHAIRMAN. Now, how would you frame a bill so that the Government could give a guaranty? I have before me a sample called "Golden Glory Fancy Table Sirup." "Sirup contains 80 per cent corn sirup, 20 per cent sugar sirup." What I want to know is this: Would you have a Government certificate on each package?

Mr. LEWIS. Yes; I would in the first place have a commission of men, of experts, who had actual facilities for getting the proper information which they wanted. Then that commission should, at the request of any manufacturer, appoint a custodian for the factory, the manufacturers themselves paying the cost of the custodian, and that custodian should have the authority to issue labels numbered consecutively, so that they could keep track of it, and those labels should be put upon the products of the manufacturer who has this custodian; this custodian to have access to all books and workings of the concern and to be able to thoroughly acquaint himself with everything that is being done. When points would come up which the custodian was not clear on, he could reserve his opinion until the commission had decided what to do. In this way every product would go out with a certain established grade, which now it does not have, and the people buying would know exactly what it contained. I might say that nearly all the food products, with the exception of the crude materials, go out on the market in cans, and the value of the canned product now depends upon the known reputation of the man who puts it up. In the other way the value of the product would have a certain guaranty by the Government as to its value, and this would be

enhanced more than the cost of this operation. Especially would this be of value in foreign countries as well as in the local markets where the manufacturers are not so well known.

The CHAIRMAN. In other words, then, you would in a general way, where there is a man manufacturing an article of food in good faith, have the Government, at a slight expense, which would be borne by the manufacturers, certify to the purity of the importation and actual condition of the stock?

Mr. LEWIS. Yes, sir; the wholesome condition of the stock. This commission also would be of great value to the consumer if it would examine the requirements of the foreign market and issue bulletins of what was required, as they do at the Agricultural Department. I give an example of that in the collection by the Government of the whisky tax where it demands certain requirements in order to collect the revenue and that draws the line between whisky that is mixed and not mixed. That itself enhances the value of two-stamp whisky over whisky which bears one stamp. Two-stamp whisky is worth more. Two-stamp whisky is bought partly on the brand and partly on the fact that the two stamps show when the whisky was made and how old it is, while whisky that only bears one stamp depends upon the reputation of the man under whose brand it is sent out. I mention this as an example.

The CHAIRMAN. In other words, the Government gives a certificate as to the age of the goods, and the age of the goods determines largely its value?

Mr. LEWIS. Yes, sir; its value.

The CHAIRMAN. Your idea would be to have food products like this practically under the supervision of the Government, and the stamps would bear the date of when it was prepared, so a man buying green corn would know whether—

Mr. LEWIS. He got this year's corn or corn 3 or 4 years old, and he himself could determine.

The CHAIRMAN. I have not read the English law, but is that, in a general way, the plan under the English law?

Mr. LEWIS. No. These matters that I have been stating lately are matters of my own suggestion.

The CHAIRMAN. You would recommend from your own experience and study—you would recommend a national commission, to be, naturally, under the Department of Agriculture?

Mr. LEWIS. I would not say the Department of Agriculture. This commission should be really under a department of commerce.

The CHAIRMAN. We have none.

Mr. LEWIS. The Department of Agriculture is now rather top-heavy. The bulletins they send out, some of them, are very fine, but others, like Edward Atkinson's on cooking foods, do not reflect very much credit on Mr. Atkinson or the Government, if they did pay several thousand dollars for it. The Department of Agriculture is overburdened with this sort of thing. This really comes under the department of commerce.

The CHAIRMAN. Of course, if there was a department of commerce.

Mr. LEWIS. The object of this food inspection is as much to enhance the value of food abroad as to protect the consumers of food at home.

The CHAIRMAN. It is a well-known fact in articles we have produced in our own country, like oleomargarine and flour and cheese, that it has increased the demand of our goods.

Mr. LEWIS. It has enhanced the value of our goods abroad, and I

think that the food law should so be framed that anyone should have the privilege of buying any kind of food he wants. If he wants a food without a guarantee, and is willing to take his own judgment for it, he should be at liberty to do so. He should not be compelled to take a Government guarantee, because there are many small manufacturers that can not afford to employ a Government custodian, where a local reputation would be all that they would want for what goods they produced. In other words, this custodian business is merely a voluntary affair. One could have it or not, as he wished.

The CHAIRMAN. You know, for instance, we began our meat inspection years ago. There was a great demand for meat, because there was a certain guarantee by the Government that our pork did not have any trichina in it; and your idea would be to pass a national law creating a commission which would in fact advance trade and commerce, and either give character or certify to the lack of character, and refuse to give a Government certificate to goods which were either frauds or deleterious to the public health?

Mr. LEWIS. Yes. It would do a great deal of good. Goods, unless properly inspected, would not bring near the price they do now, and people would not depend upon the character of the shipper or his representatives.

The CHAIRMAN. Do you think of anything else you would like to suggest to the committee? You have given this matter years of thought and attention, and we people have not.

Mr. LEWIS. I do not like to instruct. I believe that the quality of the food we eat has as much to do with our morals, or more, than the quality of the literature we absorb. I think this is a generally accepted theory.

Dr. WILEY. You suggested something in regard to the relation of the Department of Agriculture with this work. The Department of Agriculture for the last twenty years has been devoting a large part of its time to the investigation of these subjects. It has a thoroughly equipped corps of scientific experts who would be ready to assist in the enforcement of a law of this kind. There is no other Department, unless it would be the department of commerce, which does not exist, so much interested in the pure-food subject, and it seems to me under the present organization of the Government the enforcement of a law of this kind would naturally fall to the Department of Agriculture.

Mr. LEWIS. My experience with the Department of Agriculture was based simply upon what had come to my knowledge as to what it was doing. It did not seem to me that a Department that was sending out bulletins, such as it has sent out, could take any more of it. The Department of Agriculture of the United States has, within the last ten years, made more study in regard to the improving of the country than has been known in agriculture since the time of St. Francis. Agriculture originally began with the Monks, and their self-sacrifice is what gave impetus to agriculture. As the Agricultural Department has sent out so many bulletins which are so fine, it does not seem to me that they could do any more.

Dr. WILEY. We do not feel yet like we are exhausted.

Mr. LEWIS. Take for instance the instructions the Department of Agriculture has given in the matter of engineering; in the plowing of the ground in a drought, which has reclaimed millions of acres; how to plow the ground so that the water would not wash the soil off. This has been intensely valuable.

STATEMENT OF DR. H. W. WILEY—Recalled.

The CHAIRMAN. When we adjourned yesterday afternoon, Doctor, you had, I think, about completed the list of foods that were adulterated, under the class known as simply commercial frauds and not necessarily deleterious to health. Do you think of any others that you would like to speak of in that class?

Chief Chemist WILEY. The subject of the adulteration of meat and fish I did not speak of at all, and it might as well come in here. The sale of one kind of fish for another, a cheaper fish for a dearer fish, especially when they are packed in oil, is very objectionable. I am not enough of an ichthyologist to tell the kinds of fish apart that look alike, but the sale of fish like the sardine for the sardine itself is not an uncommon practice, and the stamping of boxes with foreign stamps is not an uncommon practice. The sale of horse flesh in many parts of Europe has become quite a common thing, and it is not always sold as horse flesh. Whether horse flesh has ever been sold in this country for human food I do not know, but I presume it has been. Horses are slaughtered for human food in this country, and their carcasses inspected by officials of the Bureau of Animal Industry. Whether used in this country or not I could not give any positive testimony on. It would be very easy to palm off horse flesh for beef, especially for the coarser kinds of beef. It would take a microscopic or chemical examination to determine the difference between the two. The sale of English sparrows for reed birds is not an uncommon thing, and in the same way many other birds that resemble game birds of high value. The sale of one kind of duck for another—that is, a high-priced duck for a low-priced duck—and other turtles for terrapin is often done in restaurants and markets where the people do not know terrapin by sight. They are not well enough versed in natural history to do that. These are the kinds of frauds I have been speaking of—not injurious to health, but commercial frauds.

The next line, Senator, that I would like to call attention to is the case of wines. I had a very remarkable illustration in my own experience only about six months ago. I was commissioned by the Secretary of Agriculture to obtain samples of all wines and beers and other beverages imported into this country from Germany, and to do this one of my assistants visited the custom-houses and the large importers. The importers were visited incognito, but the custom-houses we had free access to. We took samples of nearly all kinds that were brought in from one country. We wished to compare these samples with those in the hands of the wholesale and retail dealers. At one place my assistant applied for claret. The man said yes, he had lots of it, and showed large quantities. He asked me how much we wanted. My assistant said, "About two cases." "Well, all right; what label shall I put on it?" He offered, in substance, to take Chateau Lafitte, Burgundy, and Bordeaux all out of the same cask and label them to suit. It was all of the same nature. People who desire a certain kind of wine, as St. Julien, prefer that well-known variety to all others, do not care to obtain a wine of less value, so that the fraud consists in the marking of wines with brands which they should not have. This is a practice which is very much in vogue and extremely reprehensible. Our California friends are not entirely without sin in this matter, and they have adopted bodily the foreign name in some instances,

so that you can buy Liebfraumilch and Johannisberger and Rudesheimer anywhere along the Sonoma Valley. They do not put foreign labels on, however, and they do give the name of the vineyards where they are made, but they name them after well-known foreign varieties. Whether or not this is exactly honest I will leave to the conscience of the dealers. It seems to me the word "California," or some name which has become known as distinctive of the finest wine, or some other distinguishing name should be placed, as Sonoma Rudesheimer. That would be honest and would not detract from the flavor of the wine. In the same way they make sherry and port and Moselle wines. In California they call them by these names, and there is no objection to this if their California origin is also stated, so that in buying wine, unless you can detect by the name the place where they are originally grown and bottled, you are altogether certain that you are getting what the label calls for.

The CHAIRMAN. That has gotten to the question as to what are sold as frauds or as a fraud upon consumer, without due notice of what he is buying?

Chief Chemist WILEY. Without due notice; yes, sir. I never in this country have gone to a dealer yet that would not tell me exactly where he got his wines, where they were made and put up, if you would ask him. People do not take that trouble. Go into a restaurant and order a bottle of wine, and you do not feel like asking that a marriage certificate be brought with it. It is easy enough to have bottles brought in sprinkled with coal dust, so as to have the appearance of having been in the cellar for years. I have seen dust fresh looking, as though it had been put on for the occasion.

The CHAIRMAN. Now, Doctor, I want to direct your attention to—I wish you would give the committee the benefit of your experience and information as to the extent to which food products are adulterated and are deleterious to health, in your opinion as a chemist and physician.

Chief Chemist WILEY. The extent of adulteration with materials deleterious to health is not by any means so extensive as the other form of adulteration to which I have already alluded. As I said yesterday, there is scarcely any object of human food which has not at some time or other or in some country or other been adulterated. The actual amount of adulteration in the market, however, is very small. For instance, I might go to a store to-day and buy 100 food articles at random, unless they were ground spices or ground coffee—but I mean ordinary staple food—and scarcely 5 per cent would be adulterated. If you should buy spices and ground coffee and the like, the percentage of adulteration might be very high. In regard to those which are injurious to health, they are confined mostly, in the first place, to coloring materials as one class and preservatives as the second. Practically all food adulterations injurious to health may be grouped in these two classes. I will take them up in order. First, coloring materials. The eye is to be pleased as well as the palate with food. A table which is beautifully spread with artistic effects, a white linen cloth, and a few floral decorations always appeals to the eye and gives pleasure to the diner. So it is with foods. We have come to associate with the different articles of food certain tints or colors.

A food that is perfectly white would not appeal to your desire if changed to any other color, and many foods are naturally green in color, and these foods appeal to you most when they are green.

Others are yellow or saffron, as butter, and others still of mixed colors. Even our flesh and fowl and fish have tints that are distinctive. Thus a cook who understands his business not only seeks to produce a palatable dish, but one which will at once appeal to the senses through the eye. This is not a mere aesthetic feeling. It has a physiological importance, and the mere sight of food in attractive colors will start the flow of our digestive juices. The mouth waters, as the saying is, and so does the stomach, the liver, and the pancreas. All are excited to their utmost activity by the sight of food, and if this food looks appetizing it will render the flow of digestive juices stronger, and the digestion which follows is speedier and more perfect. These things appeal to the taste in its figurative sense, and the question, it seems to me, of aesthetics should be considered in the process of digestion. Many foods in the course of preservation tend to lose their natural colors, and so the manufacturers seek to restore or preserve these colors. This is particularly true of green goods which are preserved, like peas and beans and cucumbers and other things, in which the chlorophyll coloring materials should be kept intact. The green of these goods is fixed by certain chemicals, so that the tints will not lose their freshness and turn yellow. The chlorophyll is turned into xanthophyll, and thus these bodies lose their appetizing appearance and assume a yellow or tawny hue. Now, there is a chemical method of fixing chlorophyll so that it will not become yellowish, and the substances which are used for this purpose are poisonous. They are principally zinc and copper compounds. Salts of zinc and salts of copper, when added to the green materials, such as peas, preserve the natural green of the peas, as a mordant preserves the color in a piece of cloth by fixing the colors in the tissues. It is not the color of salts that are added which is seen in products, as most people suppose.

Zinc salts, which are perfectly white, have the same effect as copper salts. It is not the added coloring material which is sought for here, but it is the material which will fix and hold the green matter in the tissues of the preserved food, so that after the packages are opened the green color is as pronounced as it was at first, and the peas and beans come onto the table with the bright green that is so much desired. The amount of zinc or copper necessary to fix this color is very small, and most healthy stomachs could eat the ordinary quantity which is consumed by an individual without suffering any discomfiture whatever, and do it repeatedly. As far as I am concerned I do not object to eating preserved green peas; I like them. I know what they have in them. Many people, on the other hand, they do hurt, and the least possible amount upsets the digestion. If these materials are present this fact should be so stamped on the package, and the person can tell for himself how much he can eat, if any, and no fraud is practiced.

The CHAIRMAN. As I understand, your evidence is that while this coloring with copper and zinc may be injurious to some stomachs, it is not very deleterious to others, and you class that coloring as one of the objects that ought to be regulated on the ground that it is deleterious to health.

Chief Chemist WILEY. Regulated, but not prohibited. While on the subject of sterilized vegetable substances ("canned" is the ordinary term), I might add that poisonous and deleterious substances are often found in them, put there by accident, not on purpose. For instance, the solder which is used for sealing cans is composed mostly of lead and tin. It is an alloy. Both of these bodies are poisonous.

I have found little pellets of solder dropped in during the process of sealing. These are acted upon by the acids of the vegetables or fruits and soluble salts of lead and tin are formed. Again, what we call tin, as you know, is sheet iron washed with tin. Now, this tin is often itself adulterated. I have found as high as 13 per cent of lead in it, and it becomes to some extent lead plate. Such materials as this used for making packages should be prohibited.

The Germans have a law saying what amount of lead may be present. It is almost impossible to get tin free from lead, and there ought to be a regulation as to what amount of lead may be permitted, since an excess of it causes a kind of poisoning which is commonly known as "painter's colic." In sealing or soldering it is necessary to apply a substance which protects the metal from oxidization when the heated iron is applied, so that the solder will stick to the metal. Many things are used. Muriatic acid is one of them. The tinners take a piece of cloth, which is often pretty dirty, saturate it with muriatic acid and swab around with it, and often a drop or sometimes more of this acid runs into the food.

While on the subject of coloring materials I would like to say something in regard to the facing of tea. The green color of tea is often secured by the addition of a coloring material, and tea is made heavier by mineral substances. Sometimes sulphate of lime and sometimes sulphate of barium is added in such a way that it sticks to the leaf and gives it a better appearance and a greater weight. Prussian blue, indigo, turmeric, plumbago, and soapstone are also used. The finest teas are very often adulterated and colored in this way. This may be carried to such an extent as to be injurious.

Now, the second class of bodies injurious to health comprises preservatives. There are three ways of preserving food products. One is by sterilization, which is the ordinary canning process; the second is by a low temperature, as in cold storage; and the third is by the use of chemicals which prevent the action of the decomposing germs. Decay in all organic matters, and that includes food stuffs, is not produced by oxidization, as was formerly supposed, but all decay is due to the working of ferments, and these are of several kinds. If, now, you can defer this fermentation or suspend this action or paralyze the organisms, you can secure the preservation of the food product. To destroy these organisms sterilization is practiced, because all the organisms are killed at a certain temperature. Therefore, if any organic substance like food products be kept for a certain length of time at a sterilizing temperature, like that of boiling water, the organisms are completely killed.

Now, the spores from which the organisms come endure a higher temperature than the organisms themselves, and therefore you may kill all the living organisms by sterilization and the spores remain vital, and after a few days may develop new organisms. Therefore the sterilization is often continued longer than necessary to kill the organisms, which is done at once, as soon as the water reaches the boiling point, or successive sterilizations are practiced. This is the safer way, viz: To sterilize to-day and set aside, and when time has been given to develop new colonies of germs or ferments a second sterilization is practiced. It is not necessary to exclude the air from sterilized foods to preserve them. If you would, in a can of goods like this [indicating], leave the mouth entirely open and simply put a tuft of cotton over the mouth and sterilize it all together, the food would keep just as well and the germs in the external air will not be harmful.

The second method of preserving foods that I enumerated was the suspension of the action of the germs or ferments by cold. This is done by lowering the temperature. As you approach the freezing point the activity of all germs becomes lessened and you speedily reach a temperature at which the activity of the ferments is entirely suspended, so that organic matter can be kept indefinitely at a low temperature without decay. Cold storage is the method employed artificially or natural cold in winter is sometimes employed. A great many ferments cease their activity before you reach the freezing point, others only at the freezing point or below, but there is a temperature easily reached where all ferments are in a state of suspended animation. That is the theory of cold storage.

The third method of preserving organic substances is by paralyzing the ferments. This is done by chemical reagents, called by the general name of antiseptics. These antiseptics are large in number. I saw the Senator (Chairman Mason) using one in his coffee yesterday morning. That was saccharin. It is an excellent paralyzer, and a sufficient quantity of it would arrest the digestion completely. It has been used very extensively as a food preservative. The use of antiseptics which arrest the process of digestion is prohibited in most European states. The most common antiseptic is salicylic acid. A few years ago salicylic acid was derived by a very costly process from the willow. Hence its name, from the name of the willow (*salix*). As long as it was obtained by this process it did not have much vogue as a preservative because of its cost. About a quarter of a century ago, a little longer perhaps, a German chemist by the name of Kolbe discovered a process of making salicylic acid from carbolic acid by a simple chemical treatment, so now it is a very cheap product, and has been more extensively used in food preserving than any other one substance.

The CHAIRMAN. Do you consider it deleterious to health?

Chief Chemist WILEY. It is very deleterious to health. There is no preservative which paralyzes the ferments which create decay that does not at the same time paralyze to an equal degree the ferments that produce digestion. So the very fact that any substance preserves food from decay shows that it is not fit to enter the stomach, especially if the stomach be delicate and digestion be feeble. Most stomachs can take a little salicylic acid or sulphurous acid with impunity, because they have plenty of pepsin to spare, but when the flow of pepsin is insufficient or deficient in quality, a little disturbance of this kind interferes very seriously with the digestive process; therefore I maintain that no food should ever be offered for sale which contains a preservative without that fact being plainly marked upon it. I do not believe in prohibiting the use of preservatives, as they are often desirable in certain articles of food. For instance, take catsup, which comes in bottles of various sizes. Very few families are large enough to eat a whole bottle at a meal, so the common practice is to open a bottle of catsup for a meal and use it the next meal, and sometimes use it for weeks. This material would not keep twenty-four hours without some preservative being added. In 99 cases out of 100 it contains salicylic acid. It is just the same with poor unfortunate grape juice—such as is used in churches for communion service. It is now generally made of salicylic acid and a little bit of grape juice. You can very seldom find it composed of pure fruit juice.

The CHAIRMAN. Is it used in preserving beer?

Chief Chemist WILEY. It has been used very largely in preserving

beer, both in the wood and in the bottle, especially if the beer after going into the trade is to be kept for a long time. You do not find it in cold-storage breweries, because they do not need it there; but beers, unless they are to be consumed within ten days or two weeks after bottling, must either be sterilized, which is the preferable plan, or they must have some preservative. If these beers are subjected to an ordinarily high temperature, such as we have here in the summer time, they would speedily disintegrate and lose their flavor, and when opened have an excess of gas. The dealers almost all recognize the necessity for the use of preservatives in beers intended for domestic consumption when sterilization is not practiced. It is not possible always to sell beer promptly. The erection of bottling establishments in all large places provides for the keeping of beer until ready for use, and avoids the necessity of preserving it artificially. Salicylic acid is not now often found in beer, and this has been the case since attention was called in the report made about ten years ago to the harmfulness of salicylic acid in beer—the report of the Agricultural Department on beverages—and dealers take pride in telling their customers now that their beers are free from salicylic acid. This custom of using preservatives has been in very great vogue in the past and is still practiced to some extent. Wines as well often contain salicylic acid, and some other high-grade beverages.

The CHAIRMAN. Well, Doctor, then I understand you to say that salicylic acid is a product of carbolic acid?

Chief Chemist WILEY. Made from carbolic acid—creosote—that itself is a preservative. Salicylic acid has no odor and scarcely any taste, and therefore is preferred to creosote as a food preservative.

The CHAIRMAN. In your opinion, every package of food that is preserved in that way ought to be marked for the benefit of the consumer?

Chief Chemist WILEY. Marked, not prohibited—simply marked. There are other preservatives in common use. Borax is used in butter and milk and cream. There is a common opinion that thunder sours milk. It has really nothing to do with souring milk, but the conditions which obtain in a thunderstorm are those in which milk ferments grow with the greatest rapidity, and therefore it happens that in this condition milk turns sour more rapidly than in any other, and hence it is a common impression that it is due to the thunder.

And then there are preservatives of a gaseous nature, as formaldehyde, or, as known by the trade name, "formalin." These substances can either be used in a gaseous state or when dissolved in water, and a solution is made, and this is sold in the trade. A few weeks ago a man in Illinois sent me a package obtained from a peddler going through the country selling a material to keep milk sweet. It was called "Milk Sweet." It was about a 1½ per cent solution of formaldehyde. This man could take one bottle and sell it to the farmers at that rate and make a profit of about 3,000 per cent. He was selling it all over the State. There is no objection to its use by those who like it. However, I would not want to drink much milk containing it, for it paralyzes the digestive ferments. It is not desirable. There is one other preservative often used in butter, and that is boric acid, or borax. The above-named bodies are types of food preservatives.

I do not think, Senator, that any manufacturer deliberately puts poisonous bodies into food because they are poisons. Nobody wants to do that. These bodies are not poison, like morphine or strychnine, and do not attack the nerve centers or paralyze them. They are

poisons because they act upon the digestive organs and interfere with the digestive process. They are not in the ordinary sense poisons. There is no special action upon the nerve centers, as in the case of hydrocyanic acid or prussic acid, as it is called, a dose of which kills like a gunshot. This is one of the most rapid poisons known. These preservatives are not poisons like strychnine, which kills in ten or twenty minutes. These drugs are poisonous in another sense, simply being injurious to health and digestive processes. Now, the digestion begins the very minute the food enters the mouth. The starch in foods is acted upon by the saliva, changing it into sugar, so that if I take these preservative materials in the mouth they start at once to interfere with digestion. In chewing starchy food you fail to get the full effect of the digestion without this action of the saliva. The saliva will often in thirty seconds change starch into sugar, so that if you chew your potatoes or bread for thirty seconds or a minute you get practically all the nourishment there is in it as far as the starch is concerned. Now, when it comes to your meat, you can swallow it whole. Chewing it does no good except mechanically. Meat is not digested in the mouth. Meat-eating animals digest their food in the stomach. The carnivora swallow their food whole, while the herbivorous animals chew their food sometimes twice over, as is the case with the ruminants.

The CHAIRMAN. Now, Doctor, I want to direct your attention to the article alum. What is it?

Chief Chemist WILEY. There are various forms of alum. It is a double salt, of which alumina is one of the bases, and the other base is either ammonia or potash or some other metallic oxide. The alum part of the name, of course, is derived from the alumina in all cases.

The CHAIRMAN. Is that a healthy thing for our stomachs?

Chief Chemist WILEY. Alum is an irritant. It is to some extent an antiseptic and tends to paralyze the germs or ferments of digestion. It is poison in the sense of being an irritant, but not to such a great extent as many irritants. It irritates the contents of the stomach, and its presence in food is very reprehensible, even in small quantities.

The CHAIRMAN. Have you had occasion to examine any food products that contain alum?

Chief Chemist WILEY. I have examined baking powders which contain alum—powders used for leavening bread.

The CHAIRMAN. Do you say that it is reprehensible to use it in this way?

Chief Chemist WILEY. I would say the same of this as I have said of salicylic acid. Many stomachs can take a little alum without harm at all, but I think its presence in food should always be marked and known. It is sometimes used in bread making, where yeast is used, to whiten the bread.

The CHAIRMAN. Do you find alum in baking powder?

Chief Chemist WILEY. Yes, sir.

The CHAIRMAN. Have you examined any baking powder lately?

Chief Chemist WILEY. Not for perhaps two or three years.

The CHAIRMAN. How many different samples do you think you have analyzed?

Chief Chemist WILEY. Two or three hundred; perhaps 500.

The CHAIRMAN. What is alum used for in baking powders?

Chief Chemist WILEY. It is used to free the carbon dioxide from the bicarbonate of soda. Baking powder, as you know, is a chemical

mixture which when wet or heated, or both, evolves carbonic acid—the same gas you get absorbed in so-called soda water.

The CHAIRMAN. And all baking powder is deleterious to health?

Chief Chemist WILEY. I would not say that.

The CHAIRMAN. What is alum substituted for?

Chief Chemist WILEY. It is substituted for cream of tartar or for acid phosphate. There are three types of baking powder, all of them being alike in having bicarbonate of soda for the purpose of furnishing the gas. There is one in which cream of tartar is used and acid potassium tartrate—

The CHAIRMAN. What is cream of tartar made from?

Chief Chemist WILEY. From grapes. It is prepared from the solid material which settles in casks and bottles of wine called argols. It is the acid principle of the grape.

The CHAIRMAN. Do you consider this form of acid proper to use and healthy?

Chief Chemist WILEY. I would not say it was wholesome in excess, and I would not say it was injurious. It is practically a vegetable substance, being derived from grapes, and tartaric acid is an organic acid.

The CHAIRMAN. Well, do you think that baking powder containing alum should be so marked on the cans, so that the people buying could know?

Chief Chemist WILEY. All baking powders should be marked to show their constitution; not one kind any more than another.

The CHAIRMAN. If one was deleterious to health and the other was not, you would want to have the person so notified, so he would know what he was getting?

Chief Chemist WILEY. Undoubtedly. I should favor a general food law, requiring that things be sold for what they are. A man who sells baking powder should state what it is, what kind it is, whether cream of tartar baking powder or acid phosphate baking powder or alum baking powder. The purchaser then can take his choice. I would not say that alum powders should be absolutely prohibited, but those who use them should do so knowingly.

The committee adjourned.

CHICAGO, June 7, 1899.

I am somewhat surprised to see statements that borax and salicylic acid can be used without harm.

Drugs are forces and can not be introduced into the system without doing violence to the bodily organs.

I send you the inclosed clipping from the London Lancet, one of the highest authorities in medicine. I could cite other effects than those noted. Drugs are not foods and foods are not drugs. Each should be kept separate.

Yours, very truly,

T. C. DUNCAN, M. D.

Hon. W. E. MASON,
Chairman Pure Food Investigating Committee.

BORIC ACID INTOXICATION.

R. B. Wild, after citing a number of cases, including some of his own, distinguishes two forms of intoxication from boric acid—one in which a large quantity of the drug is rapidly absorbed from the alimentary canal, from a serous or other cavity, or from an extensive raw surface; in these cases vomiting and diarrhea, general depression, and partial paralysis of the nervous and muscular systems occur, and may cause death. A rash was noted in many instances, especially when the patient recovered or lived some days after the absorption of the drug.

The other class of cases results from the administration of boric acid or borax in comparatively small doses for long periods, and the symptoms appear at a variable time after the commencement of the drug. In some of these cases it is mentioned that the kidneys were diseased, and the author gives as a possible reason for the immunity to the injurious effects of boric acid its very rapid elimination by healthy kidneys.

Furthermore, it is possible that cases of intoxication occur more frequently than is at present recognized. Boric acid may unwittingly be taken in food and cause a toxic skin eruption which may be mistaken for eczema, psoriasis, or exfoliative dermatitis.

It may be noted that a 1:500 solution corresponds to a 17.5 grams per pint of the acid, a very large dose for an infant on milk diet and one likely in some cases to produce disturbance of the alimentary canal. It should also be ascertained that the milk ordered in cases of kidney disease is free from excess of boric acid or borax. The use of boric acid or the borates in surgery and their internal administration ought to be carefully guarded in patients with diseased kidneys, and immediately discontinued on the appearance of dermatitis or other toxic symptoms. In suspected cases examination of the urine may afford valuable evidence of the presence of the drug. (*The Lancet.*)

CHICAGO, May 20, 1899.

The Coffee Exchange of the City of New York, a recognized authority on coffee transactions, has separated the coffees dealt in into various grades or qualities, ranging from No. 1, the highest, to No. 9, the lowest quality recognized by the exchange.

These standards are the basis of all importations of Brazil coffees into the United States, which embrace five-eighths of the total coffee importations to this country.

An analysis of the five lowest standards is herewith presented. It will be noted that owing to the damaged berries averaging smaller than the sound the percentage is greater by count than by weight.

New York Coffee Exchange standards.	Weight of sound berries in 1 pound.		Number of sound berries in 1 pound.		Weight of damaged ber- ries in 1 pound.		Number of damaged ber- ries in 1 pound.		Present value in voice lots (per pound).		Cost of sound coffee, basis present value (per pound).
	Ounces.	Per cent.	Count.	Per cent.	Ounces.	Per cent.	Count.	Per cent.	Cents.	Cents.	
No. 5.....	15 ⁵ ₈	97 ¹ ₂	2,961	97	8 ¹ ₂	2 ¹ ₂	85	3	7	7.168	
No. 6.....	15 ⁵ ₈	96	3,006	95	8 ¹ ₂	4	130	4 ¹ ₂	6 ¹ ₂	6.995	
No. 7.....	15	94	3,794	94	1	6	317	8 ¹ ₂	6 ¹ ₂	6.933	
No. 8.....	14 ¹ ₂	88 ¹ ₂	3,160	82 ¹ ₂	1 ¹ ₂	11 ¹ ₂	545	17 ¹ ₂	6 ¹ ₂	6.980	
No. 9.....	12 ¹ ₂	80	2,914	70	3 ¹ ₂	20	1,220	30	6	7.680	
Triage.....	3 to 5	-----	-----	11 to 13	-----	-----	-----	-----	5	20.000	

All transactions on this exchange are based on No. 7, the exchange fixing the differences on the different grades above or below No. 7, which at the present time are 50 points (one-half cent), but owing to the enormous demand from packers of low-grade coffee for a low-priced article the street or market differences are but 25 points (one-fourth cent) between the different grades, as per above table.

CHICAGO, June 6, 1899.

DEAR SIRS: I take the liberty of handing you an analysis of five of the standard samples of the New York Coffee Exchange, which I hope may assist you in establishing a standard of grade to govern the future importations of coffee into this country, and exclude triage and inferior coffee, for which this country has been the dumping ground of the world.

I find that a large number of the importers of and large dealers in coffee are in favor of such a measure as will exclude all coffees which at time of shipment contained more than from 2¹₂ to 3 per cent of damaged berries, hulls, and sticks or valueless matter foreign to the coffee.

In the drafting of such a measure it will be necessary to make provision for such

coffees as may become damaged while in transit from the port of shipment to this country. I refer more particularly to the fine East India coffees, which continue to be shipped in sailing vessels, requiring a period of four months for the voyage.

As the vessels employed in this trade are not of the most seaworthy character, it is not unusual for a portion of the cargo to become damaged from moisture. (Coffee is very susceptible of moisture. When once wet it turns black in a short time, if not immediately dried.)

The damaged portion of these East India cargoes are skimmed, i. e., the damaged portion is removed from the sound and is usually sold as "skimmings," or damaged coffee. The sound portion that has been skimmed is known as "made sound." There are two grades of skimmings, G/S and P/S. The G/S (good skimmings) are often hand picked and placed with the "made sound" coffee. The P/S (poor skimmings) are usually too badly damaged for similar treatment.

It is the pickings from this and similar coffee which forms the triage coffee. This skimming and hand picking should be done under the supervision of the Government inspector, who should have the authority to order the triage destroyed if not exported within a certain period.

When a 5 cents per pound duty did not stop the importation of triage, some thirty years since, is it reasonable to expect a 3 cents per pound duty to do so now?

Very respectfully,

SAML. THOMPSON.

SENATORIAL PURE FOOD INVESTIGATING COMMITTEE,

Chicago, Ill.

DOCTORING BEER.

With the growth of the brewing trade and its financial power there also came an increase in the number of those who begrimed it the success it enjoyed and finally developed an organized army of enemies, who did everything possible in church and legislature to trim its wings and injure the trade. Attempts, partially successful, were made to close the breweries, to obstruct the sale of beer, and annoy both the brewers and the public as effectually as might be and throw discredit on the sale as well as the use of beer. Numberless bills in the legislatures, aiming to prohibit or curtail the consumption of beer and to give the State authority to poke its nose into the business of the brewer, bear eloquent testimony of the extent to which the brewing trade is exposed to hostile attacks, often endangering its existence and at least its prosperity. The pure-beer bills did not come only to disappear within a short time; they will remain and perhaps win in the end. Now, a rational pure-beer law adapted to American conditions would not cause any fear to anybody. But if one is acquainted with the intelligences which feel called upon to make pure-beer bills, all beer legislation must be looked upon with well-grounded diffidence.

The question what constitutes beer and how a rational, acceptable American beer law should be framed, has been frequently discussed and could be solved without great difficulty to the satisfaction of all concerned. True, the brewers are not at one themselves in all details and occupy diverging positions on various points, which are only apparently unimportant. Thus, it may not appear very important whether a certain preservative should be allowed or not, and yet this very point is apt to lead to decided differences of opinion among experts and to consequences which are far from immaterial to the trade and its reputation.

Every brewer must admit that the preparation of beer at this day, in consequence of scientific research, is different, more deliberate, methodical, and reliable than was the case in former times. Chance and luck no longer play so important a part, and ought not to play any. The beer should receive the necessary properties from the brew master, not from chance. It is in his power to gratify all demands if he faithfully follows the path that is marked out by science and does not ignore its teachings. Disturbances in the operation of the brewery and abnormal conditions will happen much more seldom, although they can not be avoided altogether even in the best conducted brewery. At this time the brewer must be capable of furnishing a faultless beer for the market, satisfying the most exacting demands in keg and bottle beer. In former times, when science could give no explanation and hence no remedy for many phenomena, the demands could not be so high, and it was natural that recourse was had to remedies which at this day are and should be rejected, foreign additions which can be entirely avoided by the superior knowledge of the day and are no longer in harmony with the evolution of the trade. These are the various drugs for "doctoring" beer which have been stigmatized and opposed vigorously by the journals of the trade.

Beer is a beverage prepared from cereals, as barley, rice, corn, wheat, seasoned with hops and passing through a natural process of fermentation and being consumed in its natural condition without foreign admixtures. From time immemorial these malted or unmalted cereals, together with water and hops, have been recognized as the proper brewing materials. All other substances having a different composition are not admissible, no matter what the reason for which they are employed. In former years—not to the extent which the public and the humorists of the press claim, however—articles were added to give a certain taste to beer or increase its stability. The practice was given up by brewers almost on their own account, because it appeared largely useless and largely because it was found that with proper management the natural way was the best. The question of stability only remained and still remains a vexed one, and brewers are still lacking somewhat in confidence in their brewing methods which ought to produce beers that do not require any preservatives. For such reasons they do not willingly emancipate themselves from certain preservatives which afford an amount of certainty and perhaps also promote carelessness and unprofessional work. But it is and remains an indisputable principle of modern brewing that there is no room in beer for chemicals of any kind; that is, products of chemical processes as distinguished from the natural processes of development in brewing. Brewers can get along without carbonate of soda, salicylic and benzoic acid, saccharine, ammonium fluoride, etc., and they must reach the point where they can, by care and appropriate methods, prepare stable beers of good taste without adding any foreign substances.

There can be no objection, however, if beer is preserved in a natural way, if it is sterilized by being exposed to high or low temperatures which accomplish that purpose. The brewer ought to have nothing to do with drugs, not only for the reason that he can not possibly take the responsibility for them which properly belongs only to chemists and physicians, but particularly because he thereby shows a certain lack of competency in his trade and, moreover, gives to the enemies a destructive weapon, enabling them to bring the brewing trade into disgrace and affording a pretext to the legislatures to lay their paternal hands upon the brewing industry in such a way that the brewer will have to fear the policeman's club in his own business and be subject to more exactions than he can bear.

The greatest and most renowned beer country in the world—Germany—has long since done away with these pretty drugs, and the scientific and practical authorities of that country, who speak with undisguised respect of our American brewing methods, are quite naturally shocked that it is possible in this country to go so far as to advocate the use of preservatives in the public press.

FRIDAY, May 5, 1899.

The committee met at 11.30 a. m. Present, Senator MASON (chairman) and Chief Chemist WILEY.

Dr. R. KENNEDY SCOBELL appeared.

STATEMENT OF DR. R. KENNEDY SCOBELL.

Who being first duly sworn, testified as follows:

The CHAIRMAN. What is your name?

Dr. SCOBELL. R. Kennedy Scobell.

The CHAIRMAN. What is your profession?

Dr. SCOBELL. I am employed by Langy & Ross, wholesale dealers in proprietary remedies. I lecture to women on health.

The CHAIRMAN. Are you a member of any association?

Dr. SCOBELL. Yes; I am president of the Society for the Promotion of Health.

The CHAIRMAN. Where is your office?

Dr. SCOBELL. We have meetings at the Great Northern Hotel every two weeks.

The CHAIRMAN. What is the object of that?

Dr. SCOBELL. To discuss various objects that ought to interest women; reform in dress and physical culture.

The CHAIRMAN. In connection with that society have you taken up the question of food adulteration?

Dr. SCOBELL. Yes; but we have not made the analyses, but at each meeting we have a demonstration of pure food and try to instruct women in the kinds they should use.

The CHAIRMAN. Please state, from your information, what are the general forms of the adulteration of food.

Dr. SCOBELL. Well, I have a paper here that will take me about two minutes to read. It is a sort of unwritten law with us in club life that we stick to our text, and I give it in this way. I have just a few ideas here, and it will only take a minute or two. Personally, I have made no investigations of food regarding their adulteration. I represent a number of housewives who have made investigations. I have had no occasion to state them before the lawmakers.

(Witness reads from paper as follows:)

SENATOR MASON AND COMMITTEE ON INVESTIGATION OF FOODS.

ESTEEMED SIRS: Personally I have had no experience in investigating foods as to their adulteration. However, I represent a vast host of housewives who have made observations and yet have had no chance to bring them before the attention of such lawmakers that could correct the existing evils, so full of menace to our families. The subject of adulterated foods is indeed a vital one, but I think the subject of contaminated food the greater one. My own personal observations have been made in reference to the way foods are kept in places they are on sale. Noting first the breadstuffs, which in most small groceries are kept outside of dirty cases, on shelving, the resting place of flies and the ever-floating dust. Bread, cookies, cakes, crackers, should all be covered with covers and bread should be covered with tissue paper.

2. Dried fruits of all kinds in open boxes on floors or counters: teas, coffee, and spices.

3. Milk, cheese, lard, butter, uncovered and in nearness to sink.

4. Candy in pails, boxes, or baskets in stores; on street uncovered.

5. Figs, dates, in open boxes, usually eaten without washing, and also small fruit.

6. Cooked meats, salt meats, and fish; in fact, all foods that are not usually washed before use.

7. Uncooked meats lying on uncovered counters, open to the incessant handling of passing crowds, who never have clean hands in Chicago, etc.

8. The careless sweeping of stores is an important matter. Vegetables and all fruits that have been exposed during the day and the dust from sweeping left to settle upon them and then sold the next day. The dust, the atmospheric impurities of street and store, the powdered filth from beast and expiration of man. As housewives we feel the first and foremost work is to plead with the lawmakers to try to bring about in some way an improvement in the care of foods in store. Housewives frequently complain of the hands of clerks in markets and groceries. An observation a woman physician made only yesterday: She stepped in a market; a clerk was cleaning a fowl. He hastily wiped his gory hands on a filthy towel and started to cut a steak. She stopped him and asked if he intended to wash his hands before serving her. He replied, "No." She declined to accept any of the stock. The handling of food should be the first thing the committee, in my opinion, would do well to start a reform in; and the grocers and people who handle food that obey the suggestions of the committee will have the hearty indorsement of the women generally, and unless a reform is instituted, the women will center their entire patronage with the few meat dealers who, by the laws of his church, has to keep himself and the meat he deals out absolutely clean.

Respectfully,

R. K. SCOBELL.

Dr. SCOBELL. They should kill the animal by letting off the blood; and we have found a case where a woman consulted a doctor for tuberculosis; he found the cause of her illness was eating meat from an animal killed from a shock on the head.

The CHAIRMAN. Do you think of anything further?

Dr. SCOBELL. We have been making a study of this investigation.

The CHAIRMAN. The suggestions you make would go to the cleanly handling of food products.

Dr. SCOBELL. Yes, sir.

Chief Chemist WILEY. In these demonstrations of food which you make at your club, what is the object which you have in view in demonstrating pure food, as you have used that expression; how do you do it? You stated that at each meeting of your club you had a demonstration of a food product.

Dr. SCOBELL. We endeavor to get a pure kind of food and demonstrate the best way to do that, and we especially show them how to cook it properly.

Chief Chemist WILEY. In your discussion of this matter have you ever insisted on the fact that food be true to its name?

Dr. SCOBELL. Yes; that is one thing.

Chief Chemist WILEY. What you buy it for?

Dr. SCOBELL. Yes. If it is not a genuine article we want to know it.

Chief Chemist WILEY. Have you ever used preserved foods in these demonstrations?

Dr. SCOBELL. Yes; and they are generally a pure article, I think.

Chief Chemist WILEY. And these preserved foods, have they been preserved by sterilization—by heat?

Dr. SCOBELL. Many have. We have heat in various ways.

Chief Chemist WILEY. Have you ever had any foods preserved by adding chemicals?

Dr. SCOBELL. Yes, sir.

Chief Chemist WILEY. Does the club regard these as thoroughly pure foods?

Dr. SCOBELL. Not at all. Some have been sent by the dealers, but refused.

Chief Chemist WILEY. Your club does not regard that kind of preservatives as tending to good health?

Dr. SCOBELL. Not at all.

Chief Chemist WILEY. You do regard sterilized food as wholesome?

Dr. SCOBELL. Oh, yes. We find the Highland brand of condensed milk a good one.

Chief Chemist WILEY. That has sugar added to it.

Dr. SCOBELL. Yes; they have their own cows.

Chief Chemist WILEY. The care and cleanliness of the animals is just as important to good butter as the handling in the market.

Dr. SCOBELL. Yes.

Chief Chemist WILEY. So many dairymen neglect the cleanliness of the cows.

Dr. SCOBELL. Yes; I frequently see milk coming in with particles of filth on top of the milk. Anything of this kind should be reformed immediately, and the animals taken care of.

Chief Chemist WILEY. Then your club regards pure food as one of the essential things to health?

Dr. SCOBELL. Most decidedly, as blood is to manufacture food and meat.

STATEMENT OF DR. H. W. WILEY—Recalled.

The CHAIRMAN. I want to direct your attention just a moment and see if I understood you correctly when you stated that some of the products of European countries were sold in this country that they could not sell in their own country—prohibited to sell in their own country. Is that true?

Chief Chemist WILEY. The laws of most European countries forbid

the addition of certain preservatives to food products. Saccharin is one I mentioned, and salicylic acid is another.

The CHAIRMAN. Don't they permit the sale of it?

Chief Chemist WILEY. As a medicine, but not as a food preservative. Saccharin, of course, as you know, is not a sugar, but a coal-tar preparation. It has a sweet taste, but is not digestible. Every particle of saccharin you take into the body passes off unchanged. It has no food value. It is an antiseptic. It prevents decay and therefore retards digestion to that extent. There is no Federal law in this country forbidding traffic in foods which are preserved in any way. There may be State laws forbidding traffic and sale of such foods in particular States, but there is no law preventing adulterated foods from being made in Illinois and sold in Indiana, nor is there any national law that would prevent the introduction of these adulterations from abroad, unless it could be demonstrated to the satisfaction of the court that they contain injurious ingredients, in which case they would be excluded under the general act forbidding the importation of injurious substances. There is no recent law regarding this matter at all. In other words, unscrupulous dealers can send to this country articles which their own laws would forbid them to expose for sale in their own country. That is the general rule, also, which applies to wines—wines, beers, and preserved foods of all kinds. We import immense numbers of sausages to this country and meats of all kinds. One does not know how they are preserved unless he makes a chemical examination of them. There is no law regulating the sale in this country, but there is in their own country, and we are placed at a disadvantage.

Another point at which our people are placed at a disadvantage is this: If a State did enact a law regulating the commerce of adulterated foods, it could not go beyond its own State lines to get at the people who manufacture the food in other States. A manufacturer in the State of Illinois may make preserved foods to which he adds salicylic acid. The State of Indiana may forbid the sale of foods containing salicylic acid, and these foods may be sent into Indiana and sold there by men perfectly innocent, who do not know that they contain acid. These men must suffer. They can not come into Illinois and reach the man who made these goods, and hence the necessity of a Federal law covering such traffic. That is all it can do in such matters.

The CHAIRMAN. What do you say about the blending or mixing of liquors, as to whether or not it is carried on?

Chief Chemist WILEY. The blending and mixing of liquors and fermented beverages is of two kinds, as, for instance, in the case of wines, to secure a uniform brand or quality, which is necessary to secure a market. That is a blending that is practiced in all wine countries. Wines from different vineyards have different flavors, due to local causes, and dealers in the various kinds of wines take them and blend them and make from year to year a uniform character of wine. Such blending as this is perfectly legitimate and unobjectionable, and even praiseworthy, because it secures for a varying article of wine a uniform standard and quality. That illustrates one form of blending. The next is where liquors and beverages are blended or compounded so as to produce a strictly artificial mixture, as, for instance, if a man should take 10 or 12 per cent alcohol and 3 per cent of such materials as sugar and glycerin, and a dash of tannin, and then a red coloring material and an artificial flavor of some kind,

made by a chemist, and a drop or two of essential oil and a little burnt sugar. Now, in mixing these bodies he can make a claret, or make a material or a mixture which is red and has chemically the same materials which are found in genuine claret. It may taste like it, and does look like it, and yet it is a purely artificial compound. Only the most careful chemical examination can reveal the difference, and only a cultivated taste could distinguish the difference. The person dining ordinarily at the table with a bottle of claret could not, unless very expert, distinguish the fact that he was drinking an artificial wine. That kind of blending is fraudulent on its face, and also experience has shown that such a compound is less palatable and less wholesome, and, in fact, may be positively injurious. While we can imitate the chemical constituents, we never can imitate nature in making them palatable and wholesome.

The CHAIRMAN. How many different samples of blended wines and mixed wines and liquors have you analyzed?

Chief Chemist WILEY. That would be hard to say. I have done more or less of this kind of work for a long time. We are now finishing—just finishing—our work on a great many samples we got last winter. We can only approximately tell. There is no way to tell with ease and definitely which samples of whisky are genuine and which are not, because it is a rare thing that nothing but pure articles are placed on the market. The whiskies, I have been told, are generally about two-thirds genuine and one-third mixed. The chemist is therefore at a loss. The only way to stop such practices in imported goods is to go right to headquarters, and in the case of imported wine, for example, it should come with a certificate from the government where it was made. If genuine, there should be no objection to the process of manufacture being open to the people, and only a law properly enforced would do this. Then there is another form of blending which is far more common, and that is in so-called distilled liquors and drinks which contain a large percentage of alcohol. Wines contain from 8 to 22 per cent of alcohol. Light claret contains only about 10 or 12 per cent, whereas port and champagne contain from 16 to 24 per cent. It is a rare thing for wine to have over from 24 to 25 per cent alcohol. Most wines only have about 12 per cent. Beers have from 3 to 6 per cent alcohol, and ales, porters, and stouts have from 4 to 8 per cent. Distilled liquors have from 40 to 50 per cent alcohol. Rums and gins and that class which we call distilled liquors run very much higher in alcohol than beers and wines. The alcohol in these liquors has been obtained by distillation, whereas alcohol in beers and wines, when it is natural alcohol, as it usually is, is obtained by fermentation without distillation. There we have entirely distinct classes of bodies.

Now, the amount of blending which is carried on in this country, I am told, is something enormous. The natural way of making whisky, for instance, is the fermentation of the grain in the first place. The grains employed in this country are rye and Indian corn principally. These are the two great sources of our whiskies. After fermentation is complete the mash, as it is called, is subjected to distillation. In distillation we have a vaporization of the alcohol and it is then condensed. The product of condensations consists of water, then common alcohol, and next a series of alcohols which are not common alcohol, but which are known by the general term of "fusel oil," and finally essential oils and ethers. Fusel oil is a term applied to a mixture of alcohols which have a higher boiling point and have a more

oily consistency than common alcohol. The ordinary alcohol is known as ethyl alcohol, while the fusel oil contains amyl alcohol and butyl alcohol and various other alcohols. There may be many different kinds. All of these distillations contain essential oils, which give the flavor and odor to the mixture. Now, these crude alcohols which are distilled in this way are not suitable for drinking. The product is raw whisky. It is colorless—water white—and has an unpleasant taste, and hence in order to make a beverage out of it must be treated so as to improve the taste. This is what is called aging. For this purpose it is put into flasks made of oak, usually slightly burned or charred on the inside. When raw whisky is put into this receptacle it extracts a little tannin from the wood and a little coloring matter. Then it begins to be slightly colored. This is then placed under the influence of oxygen, and the alcohols, under the influence of ferments, begin to oxidize. When an alcohol oxidizes it forms first what is called an ether. For instance, if we oxidize ethyl alcohol, which is the common kind, it forms what is known as sulphuric ether, the substance which produces anaesthesia. Whenever you oxidize an alcohol of any kind you get an ether. If you oxidize amyl alcohol, you get an ether of a different kind, but still the same general chemical substance. If you oxidize butyl alcohol, you get still another ether. These ethers are all extremely pleasant to the nostrils. They are all volatile, giving off odors to the air. They produce a pleasant odor and aroma, and at the same time, by oxidization, they remove the bad taste and poisonous alcohols from the mixture. In the course of several years, instead of having a mixture which is bad to the taste and smells badly and irritates, you get a mixture which has a delightful odor and taste, and is soothing, not irritating. You get a whisky fit to drink, instead of raw whisky. I have stated briefly the chemical process which takes place in the aging of whisky.

The CHAIRMAN. Give the committee some idea of the ingredients that are used in the compounding of whisky.

Chief Chemist WILEY. I was just coming to that. Now, this aging, as I say, takes years of time. It is expensive. The whisky leaks out. There is a loss in volume and a loss of interest on the value of the whisky, hence it is an expensive process. Now, the manufacture of compounded or, better, artificial whisky has for its purpose the avoiding of this long and expensive process. The makers begin with the pure article of spirits, which in the trade is known as cologne spirits and which can be made in a few hours by rectifying the high wines of the distillery. The object is to get rid of all the other alcohols that I have mentioned and to leave only the pure ethyl alcohol. And the trade name of this is cologne spirits, one of the trade names for the finest variety. The blending begins with this high grade alcohol, about 96 per cent alcohol and 4 per cent water. To this is added enough water to dilute it to the strength of whisky, which is about 45 per cent. So here they double the volume, or a little more, right to start with. The next step is to color it; to give it that brown or reddish tint which we are accustomed to associate with some varieties of whisky. That is done by adding burnt sugar or caramel. The next thing is to supply those flavors which I have spoken of as being due to the oxidization of the various alcohols, and these flavorings are easily made in the chemical laboratory. You can oxidize amyl alcohol and butyl alcohol and form these flavors. A few years ago I made a full report on these flavors to the Ways and Means Committee of Congress and will submit later as a part of my evidence a copy of

that report. I would rather do this than depend upon my memory for full details. (See for this testimony Report No. 2601, House of Representatives, Fifty-second Congress, second session, pp. 67-74, inclusive.)

The CHAIRMAN. That will be very satisfactory. May I ask you right there to state in compounded goods what, if any, of the materials used, in your opinion, are deleterious to health.

Chief Chemist WILEY. I can not say that any of these materials are unwholesome or deleterious to health when used in moderate quantities. They are chemically the same as those which are produced by the natural methods of aging in whisky. There is something lacking, however. While you can imitate nature, you can not substitute the artificial for natural products without impairing the quality of the product. There is something almost undescribable which makes a difference between the compounded and the natural products. The stomach and system are very expert wine tasters and whisky experts, and they will detect a difference, and there is a difference in effect which the chemical laboratory fails to distinguish, as experience has shown that the injury to health which is produced by, for instance, a little excess in the drinking of alcoholic liquors is very much accentuated when these artificial drinks are employed to the exclusion of the natural product. I say that without being able to state that any single substance employed in blending is injurious to health, because it is exactly duplicated by what nature produces, and yet the whole effect seems to be different.

The CHAIRMAN. Then it would come under the first class of adulterations, that class which are merely commercial frauds?

Chief Chemist WILEY. No; I would class this under both heads, without being able to point out any particular thing that causes the injury.

The CHAIRMAN. It is a fraud upon the consumer, and at the same time injurious to health.

Chief Chemist WILEY. Yes. I am not able to specify wherein the deleterious principal consists, but it is the general effect which it produces. By the way which I have described, in two or three hours the skillful compounder can make a material which looks like, smells like, tastes like, and analyzes like a genuine whisky, but still it has a different effect upon the system. The people who drink this whisky are much more liable to receive injury from it than those who drink the genuine article. What I have said about whisky is also true as to brandy, which you know is obtained by distilling wine or fermented grape juice. In the treatment of grapes, after the expression of the juice, you have left a mass of pomace which has a quantity of grape sugar and the tannic and other qualities peculiar to the grape. This, mixed with water and fermented, forms a low-grade wine. This wine, which is not put into commerce, is subjected to distillation, and brandy is the product. If this is genuine brandy it has to be aged the same as whisky to get the proper flavor and the aroma, which comes from the alcohols which it contains. Compounded brandy is made exactly the same way as compounded whisky is made. The essence dealer will sell to the brandy maker brandy essence, and to the whisky maker whisky essence. So the fraud is the same in character in both cases. This compounding is not peculiar to this country alone. They make compound brandy in Europe, so that the total quantity produced is far in excess of the actual quantity derived from grape

juice fermented and distilled. We are not the only sinners by any means in this respect.

The CHAIRMAN. There is nothing to prevent the importation of these wines and brandies in this country, is there?

Chief Chemist WILEY. Absolutely none.

The CHAIRMAN. What suggestion would you make as to a bill that could be drawn in regard to these compounded brandies and whiskies, to compel them to mark them for what they are?

Chief Chemist WILEY. I would not favor a bill which would prohibit the manufacture of these materials, but I would favor a bill which would require them to be plainly marked and stamped by the Government when it stamps its alcohol content. In fact, these compounded whiskies do not go usually into bonded warehouses, but are simply made and sold direct to the trade, so when they are stamped in the first instance with a revenue stamp the Government officials could easily see that they were stamped what they really are. I was told this by a man well informed. I do not speak of this from personal knowledge, because I do not know.

The CHAIRMAN. You have no personal knowledge?

Chief Chemist WILEY. While I am quite familiar with distilleries from a technical point of view, and also with bonded warehouses, I am not personally cognizant of the extent of this practice; but I was told by a gentleman who was well informed that considerably over half of the whisky in this country (and there are nearly 100,000,000 gallons used) was compounded whisky. Less than half was the genuine article, and while they usually mix a little old whisky with it so as to have the two kinds together, they often sell it purely and simply as it is—whisky that has no claim to be called whisky under the real meaning of that term, and brandy which has no claim to be called brandy, because it never has been in contact with the grape in any way. I am not saying anything against the business of chemical manufacture. It is a genuine and legitimate business. The making of this essence and ether is just as legitimate as the making of steel. Some of the best friends I have in the world are engaged in this business, and they are perfectly honest, upright gentlemen. I would not want any law to interfere with their business. They are just as much in favor of the proposed law as I am. They do not want either of these things to go out of their hands to be used for fraudulent purposes, and they do not like to be participants criminally in this matter.

The CHAIRMAN. The making of this essence is a perfectly legitimate business?

Chief Chemist WILEY. Perfectly legitimate. They are anxious that when these articles go into the trade they should continue under their own names until they reach the consumer and not masquerade under any false title or name. These same manufacturers make the flavoring extracts for soda water—apple, peach, and banana—simply because the chemist has found out that these flavors are due to the presence of ethers, which are cheaply made. The flavor of apple or peach is easily produced by a chemical process—by fermentation and oxidization of the resulting alcohol of some kind. Now, the chemist studied the apple, and he found out that the flavor of the apple is due to a certain ether, and he made the apple flavor. It is the same way with the banana. The peculiar flavor of the banana is one of the most abundant of synthetic ethers, amyl acetate. You open a bottle of this substance in a room, and you will think the whole place is stocked

with bananas. It is made of amyl alcohol. It is the most abundant alcohol in fusel oil. Sometimes that name is given to amyl alcohol, because it is one of the most abundant alcohols forming fusel oil. Almost every flavor nature produces has been imitated in a chemical laboratory, even musk. These flavors are sold for flavoring extracts and other purposes. You go to a soda fountain in this country and ask for soda water, and you may not get a pure fruit flavor such as you ask for. You see a great list of names hung up over the bar where they sell soda water, and you ask for this, that, or the other, and you may get a fruit extract—that is, sometimes you may—but five to one you'll get one of these ethers put up and colored to imitate the pure fruit flavor. They are much more convenient and cheaper to handle. They do not ferment. They will keep forever.

The CHAIRMAN. Do you consider them healthy?

Chief Chemist WILEY. They are not injurious to health in minute quantities. They are not as perfect and as good as the pure fruit, because in fruit you get something of the fruit, which adds to the flavor; but the real essence which gives the flavor is the same in both. The artificial essence to my taste is flat and not palatable. I do not like it.

MONDAY, May 8, 1899.

The committee met at 10.15 a. m.

Present, Senator MASON (chairman), Senator HARRIS, and Chief Chemist WILEY.

Mr. P. M. HANNEY appeared.

STATEMENT OF MR. P. M. HANNEY,

Who, being first duly sworn, testified as follows:

The CHAIRMAN. What is your name, residence, and occupation?

Mr. HANNEY. Patrick M. Hanney; residence, Chicago, Ill., 1173 North Clark; business, foods.

The CHAIRMAN. Are you a manufacturer of food products?

Mr. HANNEY. Yes, sir.

The CHAIRMAN. Where is your factory?

Mr. HANNEY. Franklin Park.

The CHAIRMAN. In this city?

Mr. HANNEY. In this State.

The CHAIRMAN. What do you manufacture?

Mr. HANNEY. Cereals.

The CHAIRMAN. Do you prepare food from cereals?

Mr. HANNEY. We manufacture the foods from the grains.

The CHAIRMAN. What different preparations do you prepare?

Mr. HANNEY. Whole-wheat flour, grain flour, rolled oats, and granulated breakfast food made from wheat pancake flour, buckwheat flour and gluten flour, wheat flakes, and wheat made into flakes the same as flour, and I guess that is pretty near all; there may be one or two others.

The CHAIRMAN. Well, in the process of the mixing, do you have occasion to come under what is known as the pure-flour bill?

Mr. HANNEY. Yes.

The CHAIRMAN. There has been some complaint, and I do not know but some just complaint, that what is known as the pure-flour bill reaches a certain class of pancake flour and materials that it was not

intended to be included in the said bill. The Committee on Manufactures recommended to the Senate of the United States the bill known as the pure-flour bill. The object of the bill was to prohibit the selling or to compel the people to sell wheat flour for what it is, and it was not intended to put tax upon legitimate mixtures which were formulated for the purposes of different kinds of cooking. Have you anything to say or any suggestions to make that may be under consideration for amendment? I am told that some of the millers of the country are willing to have an amendment made which will relieve that hardship from those who mix pancake flour and self-rising flour.

Mr. HANNEY. All I would suggest would be to put on the outside of the package exactly what is in the package, the same as the bill is now in force. Nothing further. I can't see what would be better than that.

The CHAIRMAN. You have to stamp some of your packages, do you?

Mr. HANNEY. Yes.

The CHAIRMAN. On account of the ruling of the Department that it comes within the prescribed mixed-flour bill?

Mr. HANNEY. Yes, sir; pancake flour, for illustration.

The CHAIRMAN. What is this made out of?

Mr. HANNEY. It is made out of whole-wheat flour, some corn, and rice flour, some salt, and a little raising preparation.

The CHAIRMAN. The largest part of it is whole-wheat flour?

Mr. HANNEY. Sixty per cent is whole-wheat flour.

The CHAIRMAN. Do you use any adulterants like terra alba or fuller's earth?

Mr. HANNEY. No.

The CHAIRMAN. Do you use any barytes?

Mr. HANNEY. None whatever.

The CHAIRMAN. Do you know a factory where they do use it?

Mr. HANNEY. I have suspicions about it, but I am not sure.

The CHAIRMAN. The information you have you would not want to give as positive, but simply upon hearsay?

Mr. HANNEY. I would not want to give it right out. I have never seen it put in, but it has been said there is some such goods on the market.

The CHAIRMAN. Well, as far as your goods are concerned, what do you suggest regarding the general law as to mixed flour? You are mixing from corn, whole wheat, and rice. What, as a matter of faith to the honest manufacturer, ought the Government to do?

Mr. HANNEY. He ought to get out a little description and put on the outside of the package, "This contains corn, rice, salt, soda, and whole wheat flour."

Senator HARRIS. That flour has always been sold and known to the trade as mixed flour?

Mr. HANNEY. Yes.

Senator HARRIS. There is no concealment of it. It is known as mixed flour.

Mr. HANNEY. Yes, sir.

Senator HARRIS. There is no fraud practiced?

Mr. HANNEY. No, sir; it is not put up to deceive or cheapen, anything of that kind. It is put up to make other flour more palatable. It is a mixture of different grains or cereals.

Senator HARRIS. From that standpoint you do not really think there is any necessity of a pure-flour law?

Mr. HANNEY. I did not say that. I said I could not make any amendments to the regular law now in force.

The CHAIRMAN. I understand, Senator, they had to stamp.

Senator HARRIS. I understood it came under the provision of the Revenue Department. The only point, in so far as that is concerned, would be simply the saving in regard to this stamp duty.

Mr. HANNEY. I really think it would be very beneficial to demand from the manufacturers that they put the exact formula on the outside of each package. That would do away with a great deal of this adulteration and injurious things that may be put in otherwise in the package.

Senator HARRIS. Anything in the nature of amendment to the law would be apt to open the door to fraud. Wouldn't you think that would be the result?

Mr. HANNEY. The way the law is now in force it is the most practical way you can get it.

Senator HARRIS. If you go to amend it you may weaken the law.

Mr. HANNEY. Yes, sir; get in some place where they could defraud more than at present.

STATEMENT OF MR. H. G. FURBAY,

Who, being first duly sworn, testified as follows:

The CHAIRMAN. What is your name, residence, and business, Mr. Furbay?

Mr. FURBAY. H. G. Furbay; residence, 1630 Indiana avenue, and I am connected with the Hazel Pure Food Company.

The CHAIRMAN. Where are you located?

Mr. FURBAY. Our factory is at Franklin Park, Ill. I am located in Seigel, Cooper & Co., in one of their departments.

The CHAIRMAN. Is that the same company Mr. Hanney testified about?

Mr. FURBAY. Yes, sir; Mr. Hanney is president of the company.

The CHAIRMAN. Have you anything to add in addition to the things that have been stated in regard to the manufactured goods?

Mr. FURBAY. I believe not.

The CHAIRMAN. You feel that you get unfair competition with adulterated goods?

Mr. FURBAY. Yes, sir.

The CHAIRMAN. I want you to understand and all business men to understand that this committee has no disposition to interfere with legitimate business. We have several objects in view. One is to protect the public against fraudulently adulterated goods. Another is to protect the honest manufacturer who has to sell legitimate goods in competition with adulterated goods.

Mr. FURBAY. We feel this way, that very few business men in Chicago appreciate the pure-food question purely from a commercial standpoint, and we are acting upon the principle that we believe there is more money to be made out of pure foods honestly labeled and carefully prepared than there is out of adulterated products; and at the same time I have striven to improve the health of our patrons and also their welfare in giving absolutely pure articles in competition with a cheaper grade of goods. We feel that we can produce the goods and put them on the market at a larger profit even when someone else is putting goods on the market which contain illegitimate

adulterations of the same materials. I feel personally that all goods ought to be honestly labeled, not always putting on the formula.

The CHAIRMAN. You do not want to give away trade secrets?

Mr. FURBAY. No; not by putting ingredients on the package.

Senator HARRIS. What is your definition for pure food?

Mr. FURBAY. Food prepared containing no deleterious substances. Now, there is a can of sirup [indicating can on table]. I would hardly call that pure. Sirup manufactured as it is is sirup, but it is not a high grade of sirup.

Senator HARRIS. Would you call that pure sirup [indicating another can of sirup on the table]?

Mr. FURBAY. Yes, sir; if the formula there is as it is. If I should come to talk of the adulteration of other things—it is difficult to talk on sirups. Take flour, mixed flour, which is mixed with corn, if it is so stated, would be a pure product. I would say if it has alum in it it would be an impure food—a deleterious food. Take, for example, olive oil. It is difficult to get a pure olive oil, and recent reports show that a great majority of the oil exported from France is mixed with peanut oil. It is shipped to Marseilles, where it is exported and mixed with pure olive oil and sold as olive oil. If it was labeled peanut oil it would be all right, but when it is labeled olive oil I would consider it fraudulent.

Senator HARRIS. There may be a great fraud practiced in selling pure-food products from that definition?

Mr. FURBAY. Yes, sir.

The CHAIRMAN. If that can [indicating] was marked honestly you would not consider it a fraud on the market, would you?

Mr. FURBAY. No, sir.

The CHAIRMAN. It now purports to be 80 per cent corn sugar and 20 per cent cane sugar.

Mr. FURBAY. If it was marked "honey" and sold for honey, and yet composed of honey and glucose, I would consider it a fraudulent product, but not necessarily injurious to health.

The CHAIRMAN. Now, in what way can they adulterate the foods with which you have to compete? The cereals which you represent are important not only to the consumer but to the manufacturer. In what way, are you informed, do they adulterate and cheapen this product, and in that way give you unfair competition?

Mr. FURBAY. Take, for example, flour—patent flour. It is adulterated by the addition of corn to the flour. There are numbers, I think, at the Agricultural Department in Washington that have made quite an extensive investigation in regard to that and have so discovered that to be. They have sold this patent flour for pure wheat flour.

The CHAIRMAN. Part of that is known as "flourine." Do you know what that is? It is a by-product of a glucose factory.

Mr. FURBAY. Yes, sir; I know what you mean.

The CHAIRMAN. It is called corn flour. I understand it is a different article from the corn that is ground.

Mr. FURBAY. Yes, sir.

The CHAIRMAN. You take white corn and make white-corn flour out of it and it would be a healthy food product. You take the same corn which is gotten from a glucose factory and bleach it out and grind it and make flour—is that one of the articles your competitors use?

Mr. FURBAY. No, sir.

The CHAIRMAN. Do you use any of it?

Mr. FURBAY. No, sir.

The CHAIRMAN. You are familiar with what is used?

Mr. FURBAY. No; I am not familiar with what is used in the factory. My work is chiefly in the office.

The CHAIRMAN. You do not pay any bills, do you, of that kind of flour that comes from that factory?

Mr. FURBAY. No, sir.

The CHAIRMAN. Do you have a self-rising flour in your factory known as pancake flour?

Mr. FURBAY. Yes, sir.

The CHAIRMAN. Ready to rise as soon as mixed?

Mr. FURBAY. Yes, sir.

The CHAIRMAN. You spoke voluntarily of the question of alum. I suppose you may have heard the evidence of Dr. Wiley and the medical evidence to the effect that alum is an acetic poison. Do you use any of that in your mixtures?

Mr. FURBAY. No, sir.

The CHAIRMAN. You do have to use some rising preparation?

Mr. FURBAY. Yes, sir.

The CHAIRMAN. But it is not alum?

Mr. FURBAY. No, sir.

The CHAIRMAN. Whatever it is it is very small compared to the bulk of the flour used?

Mr. FURBAY. Yes, sir.

The CHAIRMAN. Have you any adulterants that you hear that are used by your competitors to cheapen their product?

Mr. FURBAY. No.

The CHAIRMAN. Do you think of anything you would care to suggest to the committee?

Mr. FURBAY. No, sir; I think not, Senator. Taking the whole food question—

Senator HARRIS. I would like to ask Mr. Furbay if he thinks the operation of the law with regard to pure flour has been beneficial?

Mr. FURBAY. Well, I think it has.

Senator HARRIS. Has it removed any of the difficulties of your business?

Mr. FURBAY. Yes; I think it has done one thing from one standpoint of observation. I believe it is the only law I know of that seems to be at all effective to prevent the importation of adulterated food. If I were making a suggestion, it would be along that line—the enactment of a law that would operate the same way in all classes of food. For instance, Cross & Blackwell and other English firms drove American manufacturers out of the market. They were putting on the market pure food. We were producing these products cheaper than they were in Europe, and yet European manufacturers were shipping foreign foods in here. It is now turned, and we are now introducing a food of a higher grade and character than we can import.

Senator HARRIS. Did I understand you to say that such firms as Cross & Blackwell could keep their articles in the market because of the purity of their articles?

Mr. FURBAY. Yes, sir. What they put up to sell was what their label said.

Senator HARRIS. It was honest goods?

Mr. FURBAY. Yes, sir. At the present time the amount of food products—I can't speak from data—that are imported are not as high grade as those produced in our own country.

Senator HARRIS. There has been a complete reversion.

Mr. FURBAY. Yes, sir; and we could be protected by the enactment of some law that would protect all food products, as the mixed-flour law.

Senator HARRIS. If Cross & Blackwell control the market by the purity of their goods, whatever tends to hamper and retard the importation of such goods would have been a good thing to those who were producing dishonest goods in this country?

Mr. FURBAY. Yes, sir.

Senator HARRIS. How do you account for the change that has taken place?

Mr. FURBAY. In this way, that we have advanced in our general national character.

Senator HARRIS. We have become more honest.

Mr. FURBAY. Yes, sir; I believe that is true.

The CHAIRMAN. We found it was the best policy, perhaps.

Mr. FURBAY. Yes, sir; the same policy that the Hazel Pure Food Company want to put out honest articles, properly labeled, because they think there is more money in it. I think the business men will all come to see it.

The CHAIRMAN. That would follow from the proposition adhered to by Cross & Blackwell. If they had had the power controlling the foreign market by reason of honesty, of course there is an incentive for honesty here. Do not the goods of Cross & Blackwell and some other English manufacturers of preserves and marmalades still top the market?

Mr. FURBAY. Yes; I suppose they do, because they are widely advertised and better known than others upon the market now, placed there by such companies as the Hazel Pure Food Company.

Senator HARRIS. You do not manufacture anything along the line of sirups, do you?

Mr. FURBAY. No, sir.

STATEMENT OF P. M. HANNEY—Resumed.

Mr. HANNEY. I would like to suggest that when I first came to this country I traveled all around the United States in search of pure foods, and I discovered that all English manufactures and German manufactures and French manufactures were more prominently on the market. They were all well known to the people. There were no American goods or any goods then except one pure-food article for sale here.

Senator HARRIS. You say twelve years ago?

Mr. HANNEY. Twelve or thirteen. There was some market and some people putting up a few goods, but the foreign markets of the world had the whole of the market. Cross & Blackwell, Dundee Marmalade Company, Black & Son, and all French manufacturers of peas and mushrooms and asparagus. There was no such thing known in this country at that time, Senator, as high-grade asparagus or high-grade peas.

Senator HARRIS. The canning of these articles has been somewhat recent; consequently there were poor preserves manufactured in this country. Perhaps they were as high grade as those in other countries.

Mr. HANNEY. There were one or two manufacturers in New York State that put up in a small way, but there was none that was so good

as the English companies, French companies, and German companies. There was one concern in New York, Gordon & Dilworth, the only one I know of which was of general acquaintance in this country when I came here.

Senator HARRIS. Are there any manufacturers in this country now of those articles that have the same reputation for honesty in their products?

Mr. HANNEY. There are about thirty in this country now that are even better than the English companies and French and German companies.

Senator HARRIS. You do not mean to say that all the English, French, and German companies manufacture pure and honest goods?

Mr. HANNEY. No; I say that at that time they were the only goods that were known and prepared and truthfully labeled.

Senator HARRIS. There were some firms that produced honest goods.

Mr. HANNEY. A few small ones, but the most of the goods came from the English, French, and Germans.

The CHAIRMAN. I will say, Senator Harris, that it has developed here that there are many things imported—for instance, coffee—that there is a substance taken out of Germany known as “black jack” that they are absolutely prohibited from selling in Germany, but they are at present selling it here. We want to stop the importation of goods to this country that are prohibited in their own country.

STATEMENT OF J. H. MONRED,

Who, being first duly sworn, testified as follows:

The CHAIRMAN. Where do you live, Mr. Monred?

Mr. MONRED. Winnetka, Ill.

The CHAIRMAN. What is your business?

Mr. MONRED. I am a dairy expert—butter maker and cheese maker.

The CHAIRMAN. I will state that I understand that this witness said that he did not want to stay around to-day; but I want to ask him one question. We have heard some very full evidence regarding the adulteration of dairy products, and there is an article which this gentleman tells me is being adulterated; that is condensed milk. What do you have to say about this?

Mr. MONRED. I have to say that several brands of condensed milk in the market are sold which are really condensed skimmed milk. The butter fat is extracted, and as it is the valuable ingredient it is adulterated and is a fraud upon the market.

Senator HARRIS. It would not be adulterated, but an inferior article.

Mr. MONRED. I think any milkman in Chicago sells skimmed milk for adulterated.

Senator HARRIS. It is a fraudulent article, is it not?

Mr. MONRED. It is selling an inferior article under the name of the high-valued article.

The CHAIRMAN. Well, now, how do you know this? Did you analyze it yourself?

Mr. MONRED. I am no chemist, but during the World's Fair I made one or two analyses with a Babcock test and detected that even this milk had been fraudulently labeled, and found it was some 2 per cent of fat instead of $3\frac{1}{2}$.

Senator HARRIS. It was a case where skimmed milk masqueraded as cream.

Mr. MONRED. Yes, sir; and I will say that the most simple way to cover all food products is the same law as I understand now exists about flour—that it should be branded for what it is. It is not adulterated; it is substituting skimmed milk; and it is not a good food, but is an unfair food, and it should be sold under its own name and for its value. If we had a national law compelling all foods to be branded, it would cover the situation.

Senator HARRIS. The law in Chicago in effect prohibits the sale of skimmed milk, does it not?

Mr. MONRED. It allows it to be sold if the cans are tagged.

Senator HARRIS. It can be sold?

Mr. MONRED. Yes, sir. In New York City the board of health will allow it sold even, under its own name. Skimmed milk is a cheap food, and I object to its being sold as pure milk. There is great danger in condensed milk as a food for children, because they dilute it with water and starve the children.

Senator HARRIS. As far as the market is concerned you do not think the State laws would be effective or sufficient?

Mr. MONRED. Not so much in condensed milk, because it is used largely on board ships and is shipped from one State to another. I should think a national law is more important.

Senator HARRIS. At the place where they manufactured it they are required to brand it.

The CHAIRMAN. I will say that in this State to-day you go to the wholesale houses—the manufacturers brand what they ship. The pure-food law in Iowa requires the branding, while the laws of Kansas do not, perhaps.

Senator HARRIS. Suppose every State would adopt a law which required that all articles should be branded exactly what they are?

The CHAIRMAN. Yes; that is right if it could be done. That would mean the action of forty-four States, and to-day there are probably not over eight or ten that have pure-food laws that are at all effective.

Senator HARRIS. Of course, that matter could be adjusted as he suggests. Such a law would be competent, but those States having such a law would have some advantage over the others and that would lead to the introduction of such a law in every State.

The CHAIRMAN. Yes; that would be an advantage in the long run, but the temporary advantage would be with those who could sell cheaper articles under a false name. That would be a temporary advantage.

Mr. MONRED. If it is impracticable to have a national law, it seems to me that if we had a national law allowing each State to have a trade-mark—the Sauerhering bill suggested that—that each State that had a pure-food law could give the manufacturer a State brand.

Senator HARRIS. The only way I can suggest that would operate in all the States, and the best way out, is to go after them with a double-barreled shotgun.

The CHAIRMAN. Yes; we have just passed a pure-food law in this State, which I understand is very effective, but does not go into effect until a year from next July. That will give them a chance to work off their surplus acid and glucose, I presume.

STATEMENT OF MR. ALLEN MURRAY,

Who, being first duly sworn, testified as follows, to wit:

The CHAIRMAN. What is your business, Mr. Murray?

Mr. MURRAY. Drug and spice milling.

The CHAIRMAN. Where is your place of business?

Mr. MURRAY. 147-155 West Polk street.

The CHAIRMAN. When you speak of drug and spice milling, you mean that you manufacture drugs and grind spices?

Mr. MURRAY. Grind drugs and grind spices; and I might put in there drug and spice milling and importing.

The CHAIRMAN. Take the spice question first. We are a committee representing—appointed by the United States Senate to investigate what foods are adulterated and what are deleterious to health and what are not. We have no disposition to pry into a man's trade secrets. We want, however, all the facts which are proper in order to make an intelligent report to the Senate. In the matter of grinding spices, I will ask you, first, do you adulterate spices in the process of grinding?

Mr. MURRAY. Spices are adulterated. We have adulterated spices in grinding them.

The CHAIRMAN. You grind them to order for others?

Mr. MURRAY. Yes, sir.

The CHAIRMAN. What is the common adulterant used in spices?

Mr. MURRAY. There are mixtures for different spices. Some of them are made of cocoanut shells and some are made from buckwheat middlings.

The CHAIRMAN. By middlings you mean the buckwheat bran?

Mr. MURRAY. Yes, sir; buckwheat bran.

The CHAIRMAN. And a few peanut shells?

Mr. MURRAY. I do not know.

The CHAIRMAN. Do you grind these shells yourself?

Mr. MURRAY. We have ground them for the trade; yes, sir.

The CHAIRMAN. Would you object to giving the committee the names of your customers?

Mr. MURRAY. I would not care to do that. There are men here who make a business of selling mixtures.

The CHAIRMAN. That is, preparing these mixtures for adulterations—for use?

Mr. MURRAY. Yes, sir.

The CHAIRMAN. Take the spice known as allspice and pepper; the adulterant used in both of these is pretty much the same, is it not?

Mr. MURRAY. I do not know that I ever adulterated allspice.

The CHAIRMAN. How about pepper?

Mr. MURRAY. I have had to adulterate pepper.

The CHAIRMAN. You have?

Mr. MURRAY. Yes, sir; when the goods were sold and ordered that way for the trade at certain prices and sold as adulterated goods.

The CHAIRMAN. Well, they were so marked on the outside?

Mr. MURRAY. We had nothing to do with the marking. We sent them to the man who had them made.

The CHAIRMAN. You were simply acting as agent in the manufacture?

Mr. MURRAY. That is all.

The CHAIRMAN. If you had a customer like my friend Brother Stewart there, or some other good merchant, who should order a barrel of pepper at a price less than the pepper itself cost, you would have to put in a certain amount of these shells?

Mr. MURRAY. Certainly; or whatever the man might select.

The CHAIRMAN. Whatever he thought was the best adulterant?

Mr. MURRAY. Yes, sir.

The CHAIRMAN. Well, now, as a matter of fact, Mr. Murray, you have competitors in this business?

Mr. MURRAY. Yes, sir.

The CHAIRMAN. And you can not live if you do not adulterate, can you?

Mr. MURRAY. There are certain competitors that do adulterate, and it has got into the position where, unless we are treated alike—well, I will say this, that there is a certain line of goods that are considered commercial goods, that are manufactured and sold as such—for instance, commercial cream of tartar; and there is another article—

The CHAIRMAN. Commercial cream of tartar is not cream of tartar at all, is it?

Mr. MURRAY. There is some that has not got very much in it.

The CHAIRMAN. How much do you manufacture, Mr. Murray?

Mr. MURRAY. We do not manufacture very much. We had an order the other day for 5 barrels to go to Canada. We do not keep it in stock at all. It is manufactured as ordered.

The CHAIRMAN. It is made of alum, is it?

Mr. MURRAY. There is no alum in it.

The CHAIRMAN. I do not want any trade secrets. I want, for the information of the Senate, the knowledge—

Mr. MURRAY. The commercial cream of tartar costs about 5 cents a pound, while the pure is worth about 21½ cents a pound.

The CHAIRMAN. Well, that which is known as commercial cream of tartar differs from the real?

Mr. MURRAY. Yes, sir.

The CHAIRMAN. There are several articles, are there not, that are used as a substitute for cream of tartar—for instance, alum?

Mr. MURRAY. Alum is not used except in making baking powder.

The CHAIRMAN. There it is substituted?

Mr. MURRAY. Yes, sir.

The CHAIRMAN. Do you use alum?

Mr. MURRAY. Yes, sir; it is just as good as cream of tartar, I think.

The CHAIRMAN. There is a difference between the medical experts' opinions as to that.

Mr. MURRAY. I think that alum is just as healthy for the stomach as cream of tartar. If properly neutralized, there is no alum in baking powder.

The CHAIRMAN. Do you manufacture baking powder?

Mr. MURRAY. Not to any extent. We used to.

The CHAIRMAN. Do you manufacture alum that goes into baking powder?

Mr. MURRAY. No, sir.

The CHAIRMAN. Do you grind any alum at all now?

Mr. MURRAY. No.

The CHAIRMAN. Or prepare any alum in any other way?

Mr. MURRAY. No, sir.

The CHAIRMAN. Do you grind any coffee?

Mr. MURRAY. No, sir.

The CHAIRMAN. Well, you know in a general way what your competitors use, do you not?

Mr. MURRAY. No; I don't know that I do. I never was in a drug or spice mill in my life, except our own. I commenced about thirty-five years ago.

The CHAIRMAN. You have built up quite a large business?

Mr. MURRAY. And employ a great many people; yes, sir.

The CHAIRMAN. And employ a great many people?

Mr. MURRAY. About thirty.

The CHAIRMAN. And your factory is right on this street, is it not?

Mr. MURRAY. No; it is on Polk street—the west side.

The CHAIRMAN. Do you manufacture any article or goods that have your name on for food?

Mr. MURRAY. No; not for food. We stencil our barrels and boxes and spices; we put our stencil on them, and guarantee them strictly pure; and if they are not pure we do not charge men anything for them.

The CHAIRMAN. When you say they are strictly pure they are strictly as ordered?

Mr. MURRAY. Yes sir—well, I do not know—we carry in stock red pepper and cassia. All spices are ground pure. If a man wants it ground, he buys it and it is made for him especially. If he wants cassia and orders it, he gets it strictly pure.

The CHAIRMAN. Well, but suppose he orders it in such a way that it means so many cocoanut shells?

Mr. MURRAY. Then we make it for him, and he knows it.

The CHAIRMAN. You do not brand that, do you, by stencil?

Mr. MURRAY. We do not put our name on it. We simply say it is a barrel of so and so. We do not state whether it is pure or not, but in pure goods we put on "strictly pure" or "pure." If a thing is pure, that is strictly pure.

The CHAIRMAN. Well, these goods that are ordered from you are usually bought by the jobbers in this city?

Mr. MURRAY. Well, I do not know.

The CHAIRMAN. Well, generally speaking?

Mr. MURRAY. Not so much as they are from the outsiders—among scheme men—men who give away a cow or a mule, or a horse and wagon when you buy 10 pounds of nutmeg.

The CHAIRMAN. Do you prepare for the retail trade at all?

Mr. MURRAY. We have nothing to do with the retail trade. We do not sell to them at all.

The CHAIRMAN. Don't you prepare any canned goods or jars of peppers to be sold at retail?

Mr. MURRAY. No, sir; our goods are all sold in barrels and boxes.

The CHAIRMAN. And to the wholesale trade, according to their orders?

Mr. MURRAY. Yes, sir. I want to say right here that wholesale trade does not, as a general thing, order these goods adulterated. It is some of these outside fellows that have schemes or something of that kind.

The CHAIRMAN. You mean they are offering for sale a new baking powder, for instance, and advertising and offering to give away certain things?

Mr. MURRAY. Yes, sir; certainly—what they call scheme goods.

The CHAIRMAN. What other adulterants do you use under orders for your customers? You have mentioned peanut shells and cocoanut

shells. You use sometimes, do you not, what is known as pepper flour—pepper dust?

Mr. MURRAY. Yes; pepper shells.

The CHAIRMAN. And in cinnamon what do you use?

Mr. MURRAY. Mixtures of cinnamon and shells.

The CHAIRMAN. What kind of shells in cinnamon—ground cinnamon?

Mr. MURRAY. Cocoanut shells.

The CHAIRMAN. Anything else?

Mr. MURRAY. Sometimes there are some mixtures made. We do not make mixtures; we buy our mixtures. Mixtures are made of flour, and are colored and baked and ground up into mixtures.

The CHAIRMAN. Just plain flour?

Mr. MURRAY. Yes, sir.

The CHAIRMAN. Corn or wheat flour?

Mr. MURRAY. Yes, sir. They are colored when mixed.

The CHAIRMAN. How are they colored?

Mr. MURRAY. I do not know that.

The CHAIRMAN. You do not do any coloring, do you?

Mr. MURRAY. No, sir.

The CHAIRMAN. But occasionally have to use it?

Mr. MURRAY. Yes, sir.

The CHAIRMAN. Do you mix it in cinnamon?

Mr. MURRAY. Yes, and spices.

The CHAIRMAN. Where do you buy that, Mr. Murray?

Mr. MURRAY. Sometimes I buy it in Philadelphia, and sometimes here in town.

The CHAIRMAN. Whereabouts in Chicago? What number and street?

Mr. MURRAY. Well, I do not know as it is necessary to tell that?

The CHAIRMAN. I thought it might save the committee some work later on. I shall not insist upon an answer. Well, in the adulteration of mustard, what do you use in grinding?

Mr. MURRAY. Why, mustard, I believe, is generally adulterated with flour and turmeric.

The CHAIRMAN. Flour and turmeric are both harmless—not considered at all deleterious to health.

Mr. MURRAY. No; but I think some of the State laws do not allow it used—do not allow the mustard even to be colored. Some mustards are colored even without being adulterated. It is a handsomer looking article when colored than without. In the State of Michigan you can not sell mustard or any other article that is adulterated. They do not allow any coloring matter in it.

The CHAIRMAN. Do you grind any cloves?

Mr. MURRAY. Yes.

The CHAIRMAN. What do you use in these?

Mr. MURRAY. Clove stems are used.

The CHAIRMAN. What are they?

Mr. MURRAY. The stems which cloves grow on.

The CHAIRMAN. It has a slight flavor of cloves, has it?

Mr. MURRAY. Yes, sir; it makes very good cloves. You can get strictly pure cloves.

The CHAIRMAN. What do you use besides clove stems?

Mr. MURRAY. I do not think we have ever used anything except cloves in the articles we sell.

The CHAIRMAN. What do you think is the largest and most important bit of grinding you do over there?

Mr. MURRAY. That is ground?

The CHAIRMAN. Yes.

Mr. MURRAY. What do you mean—in spices?

The CHAIRMAN. Yes; in spices.

Mr. MURRAY. Well, black pepper and cinnamon.

The CHAIRMAN. And mustard?

Mr. MURRAY. We do not grind mustard to any extent, only to order. We have the highest grades of mustard which are used—

The CHAIRMAN. What in the drug department do you manufacture that goes into articles of food?

Mr. MURRAY. I do not think there is anything in the drug department that goes into food. I do not recollect any item that would be strictly a drug that would go into food, unless it is a little prutzeneil, that ladies buy to make colored cake, and some in confectionery.

The CHAIRMAN. It is harmless?

Mr. MURRAY. Yes, sir.

The CHAIRMAN. So far as coloring matter that you grind, there are only a few of them that are used substantially in confectionery, are there not?

Mr. MURRAY. Yes, sir.

The CHAIRMAN. Do you know of any that are used in confectionery?

Mr. MURRAY. Any coloring matter?

The CHAIRMAN. Yes, sir.

Mr. MURRAY. No; I can not say that I do.

The CHAIRMAN. Do you furnish any goods from your factory used in the manufacture of baking powder?

Mr. MURRAY. We used to; not of any account now. We did at one time.

The CHAIRMAN. You do so now?

Mr. MURRAY. Very little.

The CHAIRMAN. What is that article?

Mr. MURRAY. Burnt alum.

The CHAIRMAN. They manufacture that largely themselves, do they not, when they want it?

Mr. MURRAY. No. The burnt-alum business is rather a long story. I do not think you would care to hear it; but the price used to be about 24 cents, and it finally got down to $3\frac{1}{2}$ cents. There was a patent on the use of burnt alum, to begin with, and I fought it for three years and beat the patentee. The decision was in our favor. The manufacturers themselves wanted to burn it, and they reduced the price to $3\frac{1}{2}$ cents, and we went out of the business.

The CHAIRMAN. So that now no burnt alum is used in the manufacture of baking powder?

Mr. MURRAY. Yes, sir.

The CHAIRMAN. Where are these manufacturers located—what cities?

Mr. MURRAY. It is manufactured in Buffalo and in New York City. The Pennsylvania Salt Company are the largest manufacturers of it. They manufacture here in this city.

The CHAIRMAN. You do not happen to remember the street and number where this factory is located in this city?

Mr. MURRAY. The Grant Baking Powder Company manufacture their own; they used to, at least.

Senator HARRIS. Your business, Mr. Murray, seems to have two branches. One is the manufacture of your own goods, which you have in stock, and the other is the manufacture of goods to order?

Mr. MURRAY. Yes, sir.

Senator HARRIS. That applies both to the drug and spice departments, I suppose?

Mr. MURRAY. Not so much to the drugs as to the spices.

Senator HARRIS. I will take the spice department. You stated awhile ago that the goods when manufactured and kept in stock are absolutely pure.

Mr. MURRAY. Yes, sir.

Senator HARRIS. Not adulterated?

Mr. MURRAY. No, sir.

Senator HARRIS. When a man wants to buy pure goods he generally buys what you have in stock?

Mr. MURRAY. Yes, sir.

Senator HARRIS. If he wants the adulterated article, he gives you orders to manufacture it?

Mr. MURRAY. Yes, sir; gives the order and we make it for him.

Senator HARRIS. Now, what percentage does your business divide itself into? What percentage is done to order and what percentage is sold from stock—I mean in the spice department?

Mr. MURRAY. About one-twentieth. Not over 5 per cent of our business is adulterated; I mean we do not have orders for adulterated goods to the extent of over 5 per cent.

Senator HARRIS. Five per cent is done on order?

Mr. MURRAY. Yes, sir.

Senator HARRIS. Is that the proportion in drugs?

Mr. MURRAY. I do practically the same kind of business in the drug department.

Senator HARRIS. You have certain drugs ground which you have in stock which are pure, and then you will manufacture adulterated drugs?

Mr. MURRAY. We have to have a few orders. We have formulas to grind for certain manufacturers. We put up formulas for hog cholera, etc. These we grind to order and mix to order.

Senator HARRIS. These are mixtures, and very often the ingredients of these mixtures are not pure drugs.

Mr. MURRAY. Well, in most cases they are. Some are not.

Senator HARRIS. I remember several years ago having some conversation with a druggist in which black antimony was mentioned, and he said there was no such thing as pure black antimony.

Mr. MURRAY. There is such a thing, or what is called "commercial" antimony and "needle" antimony.

Senator HARRIS. It seems to be an adulterated article. The term "commercial" usually means something adulterated.

Mr. MURRAY. Yes, sir.

Senator HARRIS. You have had an extensive experience in the spice business, and what would be your opinion as to the proportion of impure goods and pure goods which are sold throughout the country?

Mr. MURRAY. I would not be prepared to say that, because we are small dealers in spices—in ground spices. Most of our sales in spices are made to the drug trade, and the drug trade are small dealers in spices. Mr. Stewart will sell more spices in a month than we do in a year.

Senator HARRIS. With your knowledge of the business, do you think that one-half of the ground spices and things of that character that are sold throughout the country are pure?

Mr. MURRAY. I am not prepared to say.

Senator HARRIS. You have no opinion on that?

Mr. MURRAY. Well, I could not say, because I never traveled among the trade and do not know the proportion sold.

Senator HARRIS. I think you said you had been in the business thirty years?

Mr. MURRAY. I have.

Senator HARRIS. It certainly seems to me that a man being in that business for thirty years in one place, like you have, would know.

Mr. MURRAY. If I wanted to show only what I have done, I could tell you, but I can not tell what other people have done.

Senator HARRIS. I am trying to get your opinion on the broader field of an expert in that particular line. I should certainly think you would have some opinion as to the general character of the goods on the market that you are competing with all the time.

Mr. MURRAY. Well, I can not say that; as far as the retail trade is concerned, I do not supply any retail trade.

Senator HARRIS. I am speaking of the manufactured articles that are on the wholesale market.

Mr. MURRAY. At the same time, Mr. Harris, you might buy as many as 5 barrels of strictly pure pepper of me and take it home and fix it up and sell it in cans, and I would not know it.

Senator HARRIS. Do you suppose such a think is done—ever done? It seems to be in your mind. The inference naturally would be that such things had been done. I am perfectly fair. What I want to get at is an intelligent idea from a man of your experience, and intelligence, and knowledge of the trade as to whether or not there is any just cause of complaint on the part of the public as to the purity of ground spices and things of that kind that are sold.

Mr. MURRAY. I should think there was just cause of complaint.

Senator HARRIS. To what extent—how far; what proportion of these goods are sold?

Mr. MURRAY. I am not prepared to say. I do not know. I can not tell you. There is no use of my going into a thing of that kind.

Senator HARRIS. You would have an opinion whether there would be 50 or 25 per cent?

Mr. MURRAY. No, sir.

Senator HARRIS. Now, let me put it in another way. Do most of the men who grind spices do practically the same kind of business that you do here in the city?

Mr. MURRAY. I am not prepared to say. I never was in their spice mills.

Senator HARRIS. You have a general knowledge of the trade?

Mr. MURRAY. I don't know that I came up here to swear to what I don't know.

Senator HARRIS. They have goods which they sell, and receive orders for manufacturing other goods. Your business is not an exceptional one, I believe. Is that the general way?

Mr. MURRAY. I could not say that. I could not answer that question. I could not tell what the spice millers do. I never looked into it, because I never knew anything about their orders.

Senator HARRIS. It seems to me that the dry-goods merchant here would know how the other dry-goods merchants do business and see that it is the same way that he does, and the drug men knew how the other drug men do business. They all do business substantially on the same general lines. Your business is not exceptional. Other spice manufacturers and spice-grinding establishments do business substantially in the same way you do.

Mr. MURRAY. Well, I should think the only way to learn that would be to call them upon the stand. I can not swear what I do not know.

Senator HARRIS. Well, I will not press the question. I would be very glad to see something that would bring about a change in our general way of doing business.

STATEMENT OF MR. GREAME STEWART,

Who, being first duly sworn, testified as follows:

The CHAIRMAN. Mr. Stewart, you have been kind enough to volunteer to give us the benefit of your knowledge and experience. I will ask you, what is your business?

Mr. STEWART. I am a wholesale druggist; I am director of the W. M. Hoyt Company.

The CHAIRMAN. How long have you been in business, Mr. Stewart?

Mr. STEWART. Thirty-two years.

The CHAIRMAN. You understand fully the scope and intention of this committee, and I want to question you first and briefly as I can in regard to the question of coffee. There are some samples of coffee which you have been kind enough to bring to the committee. I will say to Senator Harris that Mr. Stewart came of his own free will.

Mr. STEWART. I will say, Senator, that before I am examined I would like to make a statement in regard to the necessity of a national pure-food law. The various States throughout this country—Michigan, Illinois, Wisconsin, Minnesota, and other States—have passed pure-food laws, and in the distribution of merchandise—some kinds of merchandise—I find that at times errors are very likely to crop in in the shipping of goods in these States on account of the lack of uniformity, as the law of one State differs from the law of another, so that for the last ten years the merchants and manufacturers of Chicago have been clamoring for a national pure-food law, in the same manner that we clamored for a national bankruptcy act. It requires a lawyer for each State to know what the requirements are in each State in order to know the rules that prevail in them. With that understanding I will be glad to answer any questions.

The CHAIRMAN. Your idea of a national law is to have it uniform?

Mr. STEWART. Yes, sir; so that we can ship goods without fear of violating any local law. I would like to have a national law to expedite business.

The CHAIRMAN. Now, one of the complaints made is that foreign countries are able to ship into this country food products which they are not permitted to sell in their own country.

Mr. STEWART. Yes, sir; particularly in coffee. There are samples of it [indicating samples on table]. These samples of coffee are shipped from Brazil and from Hamburg and reshipped to this country. There is nothing in those samples but dead beans and sour beans.

The CHAIRMAN. Is it sometimes known as "black jack."

Mr. STEWART. Yes, sir; that is the trade name for it.

Senator HARRIS. It is a coffee bean?

Mr. STEWART. It is the overripe beans, which we call dead beans—after they have become musty and sour.

Senator HARRIS. You have there about a pound?

Mr. STEWART. About half a pound.

Senator HARRIS. Well, say half a pound of the product of coffee, and it has the appearance of coffee. It is coffee?

Mr. STEWART. It is sold as that.

The CHAIRMAN. Has it any particular value for the stomach?

Mr. STEWART. None. The drinking of that coffee, in my opinion, creates a perverted taste. It is just like some other stuff that I know of.

The CHAIRMAN. Now, what I want to get at—was this article which is known as “black jack” shipped in that state to Germany?

Mr. STEWART. It is never shipped like that from Brazil.

The CHAIRMAN. How is this procured?

Mr. STEWART. Coffee is hand picked in Germany. Germany receives coffee sometimes in the hull and sometimes in the bean, and then it is hand picked.

The CHAIRMAN. Well, now, I want to get this in the record. Now, then, this is picked out of the hull coffee in Germany?

Mr. STEWART. Yes, sir.

The CHAIRMAN. And it makes what is called “black jack,” which is not salable in Germany?

Mr. STEWART. Can not be sold there.

The CHAIRMAN. But what is sold is imported into this country and mixed with sound coffee here?

Mr. STEWART. Yes, sir.

The CHAIRMAN. What is this stuff worth?

Mr. STEWART. At the present time the price of that is very high, because there is a large demand for it.

The CHAIRMAN. How much?

Mr. STEWART. Five cents a pound.

The CHAIRMAN. When it is mixed with coffee how much does the mixture sell for?

Mr. STEWART. It depends upon how it is prepared and put up.

The CHAIRMAN. Now, you would recommend to this committee, would you not, to have passed an absolute law prohibiting the importation of this stuff to this country?

Mr. STEWART. Yes, sir; prohibiting the importation of this coffee or any other coffee with black beans in it.

The CHAIRMAN. It is not only a fraud, but is unfit for consumption?

Mr. STEWART. Yes, sir.

The CHAIRMAN. Have you samples here of coffee that contains any of this “black jack”?

Mr. STEWART. Yes, sir; there is some. [Shows sample.]

The CHAIRMAN. That looks like good coffee.

Mr. STEWART. The Senator probably is familiar with it. He sees stuff like it in his coffee.

The CHAIRMAN. What makes it shine?

Mr. STEWART. It is a preparation put on to hide the defects and cover up the fraud. It reduces the shrinkage also.

The CHAIRMAN. You have, as I understand it, competitors in every branch of your business, and in coffee particularly?

Mr. STEWART. I think so.

The CHAIRMAN. Is this largely done?

Mr. STEWART. Yes, sir.

Senator HARRIS. Have you any means of knowing, Mr. Stewart, what is the amount of importation for any one year of that class of coffee?

Mr. STEWART. I have not. The custom-house records will show, except the amount of Guatemala coffee, which may come from Europe.

Senator HARRIS. We could not import from Germany anything except that class of coffee?

Mr. STEWART. Yes, we could, because the export market is lighter than it is in this country.'

Senator HARRIS. Then the trade is influenced owing to the conditions of the market?

Mr. STEWART. Under natural conditions they would not ship any coffee to us, because the freight charges are excessive.

Senator HARRIS. You have no way of knowing—

Mr. STEWART. No; but if the consumption of this kind of coffee is prohibited in this country it will make a reduction of 25 per cent in the amount of coffee sold.

Senator HARRIS. I have been in Rio Janeiro and I have seen the process of curing coffee, and any change in the weather and large amounts of coffee will be mildewed and spoiled.

Mr. STEWART. That can be avoided. They have machinery in Brazil whereby they treat it in such a way that it comes out a very fair, decent coffee.

Senator HARRIS. That is what failed under treatment and spoiled in that way?

Mr. STEWART. No; I think not. This is the result of poor handling and probably some atmospheric change. I have never been in Brazil—

Senator HARRIS. You say 25 per cent. Do you mean the exports from Brazil would be reduced 25 per cent?

Mr. STEWART. Yes, sir; to this country. We use mostly Brazil coffee; 11,000,000 bags are imported.

The CHAIRMAN. How much in a bag?

Mr. STEWART. Twenty-five pounds in a bag.

The CHAIRMAN. What would you suggest now so as to prevent that practice of deceit regarding coffee?

Mr. STEWART. I made the suggestion prohibiting the importation of coffee with black beans in it; also prohibiting the use of glazing in coffee, because there is nothing you can put in coffee that will improve it. They improve it for the sight to sell it; it is not improved for drinking.

The CHAIRMAN. What do they use in the process of glazing?

Mr. STEWART. Gum tragacanth, glucose, and gum. I have not the formula with me.

The CHAIRMAN. Anything to shine it up.

Mr. STEWART. That is not any secret. Everyone in the trade does it.

The CHAIRMAN. Yes, but if the public—we are not in the trade and we want to know. It is a secret to me—a revelation to me.

Senator HARRIS. So far as the trade is concerned, this is only a small part of the total adulteration. Of course, if this is considered an adulteration, of course there are many other things that enter into the coffee trade besides this.

Mr. STEWART. This is practically the only adulteration that I know of.

Senator HARRIS. How about chicory?

Mr. STEWART. Nobody uses chicory any more. When coffee got to the price that was practically the same price as chicory there was no inducement. The consumer in buying his coffee in the berry—they could not adulterate with chicory, because the consumer would know.

Senator HARRIS. I am speaking of ground coffee.

Mr. STEWART. Nobody sells any ground coffee.

Senator HARRIS. What do you sell?

Mr. STEWART. We do not sell any.

Senator HARRIS. In every little country store one sees ground coffee, so called.

Mr. STEWART. Perhaps that is true in little country stores. They have packages of coffee that has this kind of adulteration.

The CHAIRMAN. I think in our small stores you buy it, and they have these small mills there and grind it in the presence of the consumer.

Mr. STEWART. That is the general practice.

Senator HARRIS. I have seen spices and ground canned coffee sold. I saw, coming into your city this morning, advertisements of Lion coffee.

Mr. STEWART. That is it. It is made by the trust.

The CHAIRMAN. What about it?

Mr. STEWART. Lion coffee is sold in paper packages with this stuff in it to make it look nice and to deceive some good housewives into the idea that it is self-clarifying.

The CHAIRMAN. Are there not two or three large concerns, such as Arbuckles, that are competing with you? Do you handle any of their coffee?

Mr. STEWART. No, sir.

The CHAIRMAN. Did you ever see any of it?

Mr. STEWART. Yes, sir.

The CHAIRMAN. What is it made of?

Mr. STEWART. It is made of that grade of coffee.

The CHAIRMAN. With black-jack mixed?

Mr. STEWART. There is black-jack in it.

The CHAIRMAN. Do you know what per cent?

Mr. STEWART. No, sir.

The CHAIRMAN. These are the packages that are so commonly used?

Mr. STEWART. Yes, sir; what the masses are drinking to-day.

Senator HARRIS. In the importation of such coffee known as "Brazil"—that is mixed with a better grade of coffee.

Mr. STEWART. Yes, sir.

Senator HARRIS. It requires hand picking to get it out?

Mr. STEWART. Yes, sir; although in Brazil they have some machinery now, I believe, that enables them to take it out.

Senator HARRIS. They could free it. I suppose the gravity is different.

Mr. STEWART. Yes, sir.

Senator HARRIS. You say by prohibiting the importation of this as the trade is now carried on—you would prohibit the importation of all coffee unless pure and genuine.

Mr. STEWART. Yes, sir; they could do it.

Senator HARRIS. It would force them to make a selection.

Mr. STEWART. It would force them to send to this country a better grade of coffee, and if shipped into this country it would require it to be hand picked. I want a better grade of goods offered to the consumers in this country. Good goods are cheap enough, Lord knows, without going into this stuff.

Senator HARRIS. That is simply your view when you are buying or selling?

Mr. STEWART. I claim pure goods are cheap at any price.

Senator HARRIS. I notice that that coffee that you say is mixed with this black-jack and glazed has a sort of a sticky feeling and shiny appearance. If the people were ordinarily posted in that—if the

ordinary layman or business man or workingman had the same information now that you and I have, they would not choose that.

Mr. STEWART. I would not.

Senator HARRIS. It is apparent upon its face. If you examine it, you can see. I have picked out of that 15 or 20 dead beans. Do you contend that they contain any injurious elements?

Mr. STEWART. I have handled coffee all my life, Senator, and I have always believed that black beans in coffee were worse than an adulteration; worse than chicory or anything you can put in.

Senator HARRIS. Is there a chemical analysis that you can use to compare?

Mr. STEWART. Yes; I can get it.

Senator HARRIS. It may be a worthless material which does not give any caffeine and does not give the quality which you would like, but makes bulk without strength. You think it is a deleterious property?

Mr. STEWART. I think so.

The CHAIRMAN. You handle a great many jellies?

Mr. STEWART. We do not manufacture any.

The CHAIRMAN. You handle them?

Mr. STEWART. Yes, sir.

The CHAIRMAN. You sell them according to what your customers want?

Mr. STEWART. We buy what the trade demands.

The CHAIRMAN. Do you have any information, personally—

Mr. STEWART. No; I have not.

The CHAIRMAN. Or jams, the same?

Mr. STEWART. No.

The CHAIRMAN. Do you manufacture sirup?

Mr. STEWART. No, sir.

The CHAIRMAN. Have you anything you could—I saw you in Washington, Mr. Stewart, representing the merchants here, and had several conversations with you in regard to teas. Last year we passed a law putting 10 cents a pound on imported teas. What effect has that had in the character of the tea?

Mr. STEWART. Just exactly what I told you at the time, and Senator Tillman and others interested in the matter. It has had the effect of shutting out the importation of all poor, trashy stuff. It has raised the price of tea, and while there was one package sold here there is now a hundred. The other stuff is shut out. Coupled with the fact of the passage of legislation regulating the importation of tea, the standards that have been adopted by the American trade are higher, and they are to-day consuming the best tea in this country of any country in the world, Russia excepted. The same would be true of coffee in the United States if they would put a duty on coffee. All this stuff would have to stay out.

The CHAIRMAN. They could not afford to pay 10 cents or 3 cents a pound on that black-jack?

Mr. STEWART. No, sir.

The CHAIRMAN. What is that [indicating]? There is another box of coffee there.

Mr. STEWART. That is simply for comparison. That is what we call "plain roast" and the other is "glazed roast."

The CHAIRMAN. Where does this coffee come from?

Mr. STEWART. From Brazil; port of Santos.

The CHAIRMAN. What is the price of this coffee?

Mr. STEWART. In the green condition, Senator, or roasted?

The CHAIRMAN. Well, roasted. Just this one [indicating].

Mr. STEWART. Nine cents a pound in bulk.

Senator HARRIS. This is the same, but it is a different grade from this [indicating]?

Mr. STEWART. I am talking about the preparation of the plain roast and the glazed roast. You will notice there are no black beans in that [indicating].

The CHAIRMAN. Was this coffee separated here?

Mr. STEWART. Brought that way from Brazil.

The CHAIRMAN. They have the same process—it is hand separated?

Mr. STEWART. No; I think by machinery. A number of concerns have put in large plants doing that work, especially in the higher grades and better grades of coffee.

Senator HARRIS. I would like to ask Mr. Stewart regarding another matter. He handles spices?

Mr. STEWART. Yes, sir.

Senator HARRIS. Take spices. I would like to know if you have any opinion as to the proportion of adulterated goods?

Mr. STEWART. Six years ago we discontinued the handling of any kind of spices except strictly pure, and turned them out under our own brand with a guaranty on every package. We did not manufacture for jobbers, but only for our own trade.

Senator HARRIS. You sell to the retail trade?

Mr. STEWART. Yes, sir.

The CHAIRMAN. What Senator Harris wants to get at is your opinion as to the amount of adulterated spices that are sold.

Mr. STEWART. Well, my opinion would not be worth very much for this reason, that seven years ago we stopped handling scheme goods.

The CHAIRMAN. This term has been used here this morning several times, applying to commercial this and commercial that, which means an adulterated article. Is that largely used in the trade; is it a well-defined portion of the general trade?

Mr. STEWART. I think not. I think, as a rule, the wholesale grocers who have roasting and grinding plants of their own and who make a business of grinding spices are handling a pretty good class of goods; but I do believe that those people who handle carts and hay rakes and buggies and give them away with a hundred pounds of spices must handle a pretty poor grade of goods. They must make money somehow, but how I do not know.

The CHAIRMAN. You can tell, as a grocer, something about the purity of imported goods compared with pure goods by the price list. When you see an article below a certain point, you know it can not be pure.

Mr. STEWART. Certainly.

The CHAIRMAN. Do you find in the trade a larger proportion of the goods in spices than of other goods?

Mr. STEWART. Certain goods are put on the free list. The prices are very low, and I think they have found it difficult at times to find adulterants that would go in.

The CHAIRMAN. That has had a tendency to reduce adulteration.

Mr. STEWART. Yes, sir.

The CHAIRMAN. We had it testified to this morning that the duty had a tendency to increase the purity of a certain class of goods.

Mr. STEWART. That is so. I am talking about it from a hygienic standpoint.

Senator HARRIS. As arriving at certain results which are hygienic. Now, in the articles such as jellies and preserves, do you think they are generally pure goods?

Mr. STEWART. I do not believe there is 5 per cent of the jellies sold that are pure. I do not believe that. I am saying that from what I see going out in tubs and in retail stores and everywhere.

Senator HARRIS. The adulterations are chiefly in the way of glucose?

Mr. STEWART. They put in glucose a very small per cent and acid of some kind to make it.

Senator HARRIS. What would be your idea of arriving at the purity there, by requiring them to be branded?

Mr. STEWART. My idea, Senator, is not to prohibit the sale of anything of that kind; that it shall be branded and sold for what it is.

Senator HARRIS. As oleomargarine dealers are required to do?

Mr. STEWART. Yes, sir.

Senator HARRIS. But suppose it is difficult to distinguish the fact that some of these glucose combinations are unhealthy?

Mr. STEWART. I would not say that.

Senator HARRIS. It is only a question of honesty in dealing.

Mr. STEWART. To prevent the dishonest cutting of prices by jobbers and retailers. Many sell glucose jelly for half price, and you can't understand it.

The CHAIRMAN. And the same would apply to honey?

Mr. STEWART. Yes.

The CHAIRMAN. Do you manufacture honey?

Mr. STEWART. No, sir.

The CHAIRMAN. You keep no bees?

Mr. STEWART. No.

The CHAIRMAN. Your opinion would be much the same as to that?

Mr. STEWART. Yes, sir. I have a very strong idea and opinion in regard to the branding of all goods just what they are. It applies equally to baking powder, as I learned the other day. The law of Minnesota requires them to put on the labels just what is in the boxes, but it does not apply to imported things, only that which it produces.

The CHAIRMAN. That is, the chemical reaction?

Mr. STEWART. No, sir; that is an unimportant thing very few consumers know. I do not believe that Mrs. Mason or Mrs. Harris, when they go into a retail store and ask for baking powder, providing the formula is on the label of the can, would know what amount or what was going to be produced. I think the pure-food law ought to state that on the label—every can, box, or barrel.

STATEMENTS OF C. S. N. HALLBERG,

Who, being first duly sworn, testified as follows:

The CHAIRMAN. Where is your residence, Mr. Hallberg?

Mr. HALLBERG. 34 Elaine place.

The CHAIRMAN. What is your business?

Mr. HALLBERG. I have no business; I have a profession.

The CHAIRMAN. What is your profession?

Mr. HALLBERG. I have been editor of the Western Druggist for several years. Since 1890 I have been professor of pharmacy at the Chicago College of Pharmacy, Chicago University. Since 1890 I have

been a member of the committee on the revision of the pharmacopœia of the United States.

The CHAIRMAN. Revision of the laws relating to pharmacy?

Mr. HALLBERG. Yes, sir.

The CHAIRMAN. By whom were you appointed on that committee?

Mr. HALLBERG. Since 1820 the delegates meet in Washington every ten years from all the medical and pharmaceutical societies of the United States. This convention chooses its members, 25 members, and these members issue a work which is the standard of authority for medicine. The reason I refer to this is because outside of pharmacy—that is, outside of medicine—there is no standard for the identity, quality, purity, and strength of natural substances. I believe that a national law should be based upon a work of standard authority, prescribing and defining what natural substances are, their derivation, composition, the strength, purity, and quality, just as we have in medicine. Take the example here of coffee. Coffee in the pharmacopœia is defined as the seed of the *Caffea arabica*. Cloves are defined in the same way. Now, if there was a standard for these substances when they are not used in medicine, such questions as you have discussed here this morning would not be necessary to discuss, because the immature seeds of the coffee which have been shown here this morning do not contain any appreciable amount of the principle which the seed must contain in order to be coffee as defined by the pharmacopœia. It contains scarcely any caffeo-tannic acid. In the same way with cloves, the stems of which and the expanded flower in which cloves grow contain scarcely any oil of cloves, which is the valuable principle of cloves.

With the exception of a few articles which the Government has seen necessary to fix a standard for, such as the lime test in kerosene, and such as the quality of sugar when there is a bounty to be paid, as was the case some years ago, the value of the sugar being determined by a polariscope test, as has been done recently with flour—aside from these few instances, there is no standard whereby you can measure the quality, the purity, the strength of these substances. And this is necessary. Furthermore, I believe that a national law and nothing short of a national law will be sufficient. As Mr. Stewart has referred to, these laws in various places are often deficient, and for the most part they are administered by persons who are either unqualified or ignorant, as is the case and has been in the last four years in the State of Ohio. They founded a commission in Ohio last year, formed of two inferior chemists in Cincinnati, to examine Scott's cod-liver oil, and they reported that it was loaded with morphine. Examination afterwards showed that there was no morphine in it. Anyone familiar with the situation would know that there could not possibly be any morphine in it. The food commission of the State of Ohio was placed in jail. Last year I went to New York for this firm, as they were having all sorts of trouble. That is one of the facts in connection with a State law pertaining to foods. The administration of a national law must be placed under the supervision of a national board of health. So many questions come up pertaining to the adulteration and sophistication and substitution of foods that can not be settled except by a scientific medical research, that even our present exceedingly laborious and valuable Department of Agriculture can not settle this question. There are so many illustrations of the complications that exist with reference to this question. Your witnesses here will make one assertion and in the next few minutes will contradict the same assertion.

Mr. Murray, for example, here said that alum, when neutralized, would not be any more as alum in the bread. Now, of course, he is no chemist. He should not lay himself liable to any such statement as that. The question of whether or not alum is an irritant poison to the system, as has been testified to by Dr. Wiley, has not as yet been entirely settled. I hold that it is absolutely necessary that we should have a national board of health, or a department, in fact, of health, which would have branches and work in conjunction, if necessary, with the Department of Agriculture to settle these disputed questions for a definite standard, with certain limitations as to the quality and strength and purity of these various substances. Take the question of the use of antiseptics, as was referred to and as was shown by Dr. Wiley. Antiseptics should not be entirely prohibited, but their use should certainly be limited. Now, where should the limitation be? Should we rely upon the various manufacturers to use their own judgment in the matter? Certainly not. The limit must be placed by high medical authorities, after thorough investigation. If you will permit me, I will call your attention to a phase which has been agitating the people of this country the last few months which has a direct bearing upon this question. According to the testimony of the men that were most vitally interested in the manufacture and preserving of canned goods—according to their testimony the article called canned roast beef was made by first boiling and abstracting a large per cent of extract. Then this beef residue was put in cans and subjected to high heat in retorts, that being said to be the roasting process. This beef is unfit for our food, as was shown by Professor Liebig when he published the Process for the Manufacture of Extract of Beef, with which his name is so associated. He called attention to the fact that the extract did not represent the nutrition of the beef. He warned the medical profession against falling into the belief that an extract of the beef would be a substitution for the beef itself. He also studied out that, while the nutrition, the fibrin—that is, the fiber, the strength of the meat—is chemically the same as egg white and does not represent the nutrition of the beef, at the same time its digestion and assimilation were dependent upon the presence of the principles represented in the extract, and that, while therefore these substances represented the total nutritive quality of the beef, they should not be used singly. Now, if we had a national board of health, for example, where questions of this kind could be referred and settled, we would avoid all of this trouble about such articles as canned roast beef.

The CHAIRMAN. And the question of beef extract, Mr. Hallberg?

Mr. HALLBERG. Even this canned roast beef has a certain use. We get it practically once a week when we get boiled beef, but I never eat boiled beef without horseradish or mustard. No boarding-house keeper who knows her business would give it more than once a week, because the substances have been taken out of it for complete digestion and complete assimilation of the beef. I simply want to come before your honorable committee and lay before you what I believe are necessary conditions for a law. I believe that is the ultimate object of your committee, the drafting of a law. I do not believe I have anything to add except this. I am opposed to the idea which has been advanced here by nearly all of the witnesses, that all that is necessary is to state on the label what the composition is of the substances. I believe that there are many things that are used in foods

and food products which are deleterious to our health and should be absolutely prohibited.

The CHAIRMAN. Yes.

Mr. HALLBERG. These are so largely used.

The CHAIRMAN. I think, Professor, if you will let me say—I think that nearly every witness here who has testified has had his attention called to deleterious things. For instance, like the use of terra alba or white earth or barytes in flour. You think these things that are deleterious to health should be prohibited?

Mr. HALLBERG. The so-called dairy expert who stated that he was not a chemist and testified to the use of skimmed condensed milk stated that it itself was not objectionable; that it was a pure food.

The CHAIRMAN. Yes.

Mr. HALLBERG. That is not the case. There is no telling how many infants may have been starved and died from the use of milk made from such condensed milk. What an infant needs in its growth the first and second years more than anything else is fat—is the butter fat—and therefore the feeding of an infant, without knowing it, with milk made from such an article—skim milk which has been deprived of the fat—is a species of slow murder and should be prohibited. These people who buy this do not understand it. As Mr. Stewart has stated, the people do not know the reaction, the chemical reaction, that will take place in a certain mixture. In baking powder, therefore, simply a statement of the formula or composition would not be sufficient protection. Now, there are a great many things that are in the same category. As far as I am concerned, I would no more think of buying a sugar preparation made up of glucose than I would think of buying this black jack for coffee. I know that the question is disputed. There are chemists that will say that glucose is healthy, and there are chemists that will say it is unhealthy. So you may go through the entire class. I believe that nothing short of some high authority working in conjunction with the Agricultural Department, that should have experts engaged who would study these questions and then report to the people and absolutely prohibit everything that has been proven beyond question to be deleterious to health, would be sufficient.

The CHAIRMAN. Then, in your opinion, glucose used as a substitute for malt in beer would be bad?

Mr. HALLBERG. Not to the extent that it would be a substitute for sugar if used to preserve, because the sugar from the malt is converted into glucose in the making of beer. All sugar, in fact, has to first be converted into glucose before it can ferment. This is the difference between sugar and glucose. Sugar can not ferment; it has to be changed into glucose first, and then the glucose will ferment and form alcohol.

The CHAIRMAN. You prefer beer made of hops and malt to beer made of glucose?

Mr. HALLBERG. Yes, sir.

The CHAIRMAN. You think that every other consumer ought to have that privilege?

Mr. HALLBERG. I would like that he should have it. There may be others that differ with me.

The CHAIRMAN. It certainly could not do you any harm if you wanted glucose beer to be advised of it in advance. When you buy it you ought to have the privilege of knowing what you are buying.

Mr. HALLBERG. Senator, I am afraid you are not sufficiently

advanced in chemistry to understand the fine point that I tried to draw.

The CHAIRMAN. I think I understood what you were saying.

Mr. HALLBERG. You can take glucose that is made on Taylor street, and you can, by the introduction of a ferment, convert that into a kind of beer. Now, that is almost the same, except the taste and color, and by manufacturing the glucose from barley malt and allowing that to ferment you make a beer. You have got to have glucose in both instances. The difference is, glucose is made from corn and the other from barley malt. All whisky is made from glucose. The starch of the corn is changed first into glucose, and then glucose is fermented and turned into alcohol.

The CHAIRMAN. If you had a board of national food commissioners or health commissioners, or any other board, under, you say, the Agricultural Department, you would give them power to make rules and regulations in regard to the branding of foods?

Mr. HALLBERG. Yes, sir; and make limitations.

Senator HARRIS. Your idea, as I understand it, is that they should examine all of these articles and establish certain standards below which none should go.

Mr. HALLBERG. Yes, sir.

Senator HARRIS. In regard to the use of glucose in beer and everything else, you are simply discussing what you think the most effective means at arriving at an end, as to which course seems to be the most desirable. You assume that there is an immense amount of adulteration that should be stopped.

Mr. HALLBERG. I know it.

Senator HARRIS. Not alone adulteration, but an immense amount of selling of articles which are not only adulterated but are deprived of the essential qualities that they should have, such as condensed skim milk.

Mr. HALLBERG. We classify and differentiate these into three classes—adulteration, sophistication, and substitution. The direct substitutions are the most important of these divisions. If you will allow me an illustration, the Government collects a duty on opium, as you know, and there used to be a great deal of adulteration of opium introduced in this country, and the United States pharmaeopœia defined a minimum limit of morphine contained in opium, which is 9 per cent.

Senator HARRIS. You say that opium to be called opium must contain 9 per cent of morphine?

Mr. HALLBERG. At least. Now, the revenue department of the Government examines all opium that is imported in this country and does not permit any opium imported into this country unless it contains 9 per cent of morphine. That shows the value of a standard. We could fix a standard in coffee. We could make various grades of it. We can say that one grade of coffee can contain 10 per cent of caffetannic acid, and that would be an excellent criterion, because this black-jack contains scarcely any. This black-jack is simply the immature seeds, and the full growth of the plant has not been reached, hence the caffetannic acid has not been developed in these seeds, due to the lack of proper nourishing or some condition of that kind. That is not an adulteration. That would be sophistication. I might add this for the benefit of the committee. Take the composition of milk. There are various means adopted and certain ordinances are passed fixing a limit for the value and consistency of milk. For example, 21½

per cent of fat and $5\frac{1}{2}$ per cent of sugar, and so on. That has done a great deal toward improving the quality of the milk. Before there was a standard fixed there was nothing to go on, simply the ordinary attributes, the only test being by the eye and the nostril. You can see how it would be when a man could spend his whole life sitting day by day testing tea samples by tasting. I do not see how he can possibly arrive at the real consistency of the tea by the taste. Far better would it be to have a chemical analysis and know what the tea should consist of; fix a limit and have them come up to that standard.

Senator HARRIS. Of course, in testing they have other tests—the scent and weight and feeling and general appearance. But you think the best way is by establishing a standard adopted by the United States Government?

Mr. HALLBERG. That is the only correct process, and I think it can be done. That principle could be extended to nearly everything. Take spices. We have no per cent of the actual principals in spices. We can fix a minimum limit and exclude everything else that is not up to the standard.

Senator HARRIS. Professor, you know the process of adulterating spices by using cocoanut shells. Is that soluble in the stomach?

Mr. HALLBERG. About as soluble as are the integuments that consist in the spice itself. Take for example cloves. Now cloves flower, for that is what we know as cloves—the flower of the plant. That flower contains anywhere from 10 to 15 per cent of volatile oil, and that volatile oil of cloves is what represents the flavor of the cloves. In addition to that it contains a little resin. That gives the pungency. Now these substances that have been mentioned as adulterants do not contain any of these principals. They are not deleterious. Any of these that have been mentioned are not deleterious, they are simply a cheat on the public. Now, Mr. Murray spoke of powdered capsicum. If there is a pound of pure powdered capsicum in Chicago I am willing to swallow this book. It consists chiefly of red brick dust.

Senator HARRIS. What is capsicum?

Mr. HALLBERG. It is the fruit of the plant cayenne pepper. It is called red pepper because it comes from Cayenne, one of the provinces of South America. It is so infernal hot and pungent that if they sold the pure powdered red pepper no one could possibly use it, and it is found necessary to reduce it mostly by brick dust. A little of it goes a long way and there is no especial harm done.

Senator HARRIS. You do not think brick dust is just the thing to take into the stomach?

Mr. HALLBERG. Oh, I don't know. I think it is a splendid thing sometimes. It is one of the very best things that can be taken into the stomach for many complaints. If you will allow me I will next say a word on the question presented by Senator Harris this morning, in connection with the substance black antimony. You are correct regarding the absence of black antimony in the market. There has not been any for years except in chemical specialties. What has been sold for black antimony is a mixture of powdered coal dust. Farmers used to use this largely as an ingredient in hog powders—to feed the hogs and kill the hog cholera. Within the last five years there has not been any black antimony used of any consequence, because the farmers found that by burning some corn they could get better results than they got from black antimony. There is where an imitation proves to be a good thing, because it led the farmers to see the great value of the grain for chemical purposes, and the farmers now burn corn to prevent hog cholera.

Senator HARRIS. That is a substitution?

Mr. HALLBERG. Yes, sir.

Senator HARRIS. What is black antimony?

Mr. HALLBERG. It is a sulphide of antimony. One of the ores of antimony; the kind that Brice tried to make gold out of.

Senator HARRIS. Of course, as you say, it is a question of means to an end. You therefore are of the opinion that the appointment of a properly qualified national board to investigate all these questions and to fix standards would be the simplest and most direct method to arrive at the end, and then, of course, that would have to be enforced by a law which would prohibit the sale of anything falling below the standard prescribed by this board.

Mr. HALLBERG. Just so; except, perhaps, possibly under certain restrictions.

Senator HARRIS. There might be some latitude allowed under certain circumstances?

Mr. HALLBERG. Some things should be prohibited.

Senator HARRIS. Of course, those that are deleterious.

Mr. HALLBERG. Yes, sir.

The CHAIRMAN. You would prohibit the use of white clay in flour?

Mr. HALLBERG. Yes, sir. I would put a limit on all antiseptics. No wine should be sold except with a minimum percentage of salicylic acid, boric acid, and all these things.

The CHAIRMAN. Those which are used for the purpose of preserving wines and beer?

Mr. HALLBERG. Cider is now preserved chiefly with a fluoride of ammonia or soda, one of the most powerful disinfectants that we have.

The CHAIRMAN. Do you consider it deleterious if much is used as a preservative?

Mr. HALLBERG. This fluoride of soda, when it decomposes, furnishes hydrofluoric acid. That is what is used to etch glass. It is the only substance known that can not be kept in glass bottles. It has to be kept in hard-rubber bottles. As to its effect in the stomach, I will leave you to draw your own conclusions.

Senator HARRIS. Take the duties of this board—you say there is no such thing as a pound of pure capsicum, and there is a sort of reason for reducing its strength by reducing it by substances. Do you think the duties of this board should go so far as to prescribe the standard strength of capsicum, and should it also enter into the field of saying what should be used to weaken it?

Mr. HALLBERG. Yes, sir.

Senator HARRIS. That it should prescribe some harmless substance which would weaken it, or would you leave it to the common sense of the public?

Mr. HALLBERG. No; I think they might designate what would be the dilutant. That is done by the pharmacopœia. There are diluting powders occasionally, and there is a dilutant prescribed, chiefly sugar and milk, which are inert and having no deleterious effect.

Senator HARRIS. Now, take the question of condensed skim milk. Could the duties of a board go any further than to require the manufacturers of condensed skim milk, which may be used for many purposes, not only for the nourishment of an infant—would you prescribe a standard or would you prohibit its use altogether.

Mr. HALLBERG. There is no use for milk except for nutritive purposes, and because of that it should be prohibited.

Senator HARRIS. You do not mean to say that there is absolutely no nutrition in skim milk?

Mr. HALLBERG. The community can not afford to permit a condition which will make it possible for an ordinary person to buy a certain kind of food when his very life or health may depend upon the quality of that food.

Senator HARRIS. Well, if it was branded. You can not go so far as to take away all the nourishment. Now, skim milk has some nutrition. Of course, it is not as good as what is called whole milk. Of course it don't pretend to—

Mr. HALLBERG. I do not know sufficiently to have an opinion on that. That is the way I feel from a hygienic point of view. There may possibly be some reasons for a modification, but I believe the principle should be that where anything has been decided unequivocally, that it is injurious to health it should remain, as it prolongs life.

Senator HARRIS. You must see a difference between what is absolutely injurious and what is not nutritious.

Mr. HALLBERG. It is very hard, Senator, to do that.

Senator HARRIS. Now, an infant may be able to live, just as a calf can be brought up, on skim milk. It will not be so robust a child or so robust a calf as if it had whole milk. It is like you said a while ago. It is more or less a process of starvation if continued long enough, but I was only getting at your idea how far this board should go in prohibiting.

Mr. HALLBERG. That is a matter that would have to be decided by very careful work and by men of the very greatest ability. It can not be done by alleged experts, by the average manufacturer. It must be done by men that have devoted their whole life to the subject.

Senator HARRIS. Wouldn't it be a step in advance if we could have everything labeled clearly as to substance and sold under true colors? That would be a great step in advance.

Mr. HALLBERG. Not a great step. It would be a step, but not a great step.

Senator HARRIS. Well, if we had a law which would make them show clearly the extent of the adulteration, it seems to me a very large amount would be stopped if the people could see what they are buying—were told the composition of it.

Mr. HALLBERG. What good would it do to have large labels conveying information that is merely technical? It might state in the case of baking powder that it would contain gypsum or plaster of paris. Many must contain that, because a great deal of the cream of tartar is half gypsum, and the average housewife would not know what gypsum meant or its injurious effects.

Senator HARRIS. There is a mooted question as to the extent to which alum is injurious.

Mr. HALLBERG. Yes, sir.

Senator HARRIS. If we knew that baking powder contained no alum, we would get the benefit of the doubt?

Mr. HALLBERG. Yes, sir.

The CHAIRMAN. If they marked them for what they are, we could then choose.

Mr. HALLBERG. But it is something that is very much abused. We have proceeded on that line in drugs and medicines outside of the pharmacopoeia—that is, in articles that are unofficial the compounder has to print on the labels what the ingredients are—the formula—and it has now been in vogue largely more than ten or fifteen years. It has been so much abused that there is no longer any faith attached by the buyers or the users of the formula on the label.

The CHAIRMAN. Well, they would not know an honest formula; is that the idea?

Mr. HALLBERG. Yes.

The CHAIRMAN. Of course, if there was a law enforcing it, that formula would have to be honest; and if on chemical analysis it was found to be dishonest, the manufacturer would have to suffer the penalty.

Mr. HALLBERG. Yes; that would be done, but it would be very difficult to enforce laws of that kind, because organic chemistry, which is invaluable, is only in its primitive stages in this country. There are very few chemists that are able to make a correct examination of any food product.

Senator HARRIS. Do you think that the adulteration of drugs has been carried on to a very great extent in this country?

Mr. HALLBERG. Yes, sir.

Senator HARRIS. I do not know, Mr. Chairman, whether the drug question comes under our jurisdiction or not.

The CHAIRMAN. Except where it is detected in food. Dr. Wiley says that everything that goes into the stomach is food.

Mr. HALLBERG. Well, there are flavoring oils and preparations of that kind which always come under the food definition.

The CHAIRMAN. He says all drinks are legally and technically foods.

STATEMENT OF MR. GEORGE C. REW.

Who, being first duly sworn, testified as follows:

The CHAIRMAN. What is your business, Mr. Rew?

Mr. REW. I am a chemist.

The CHAIRMAN. What is your address?

Mr. REW. 38 Michigan avenue.

The CHAIRMAN. Have you taken any special course in chemistry?

Mr. REW. I took a general course in the University of Michigan. This question I had in mind—from what I understood from the remarks of Professor Hallberg—I understood him to question Mr. Murray's statement, that in properly prepared alum baking powder there would be some alum left in the food prepared with this baking powder. As a matter of fact, when alum and bicarbonate of soda are mixed in their equivalent proportions there will not be one particle of alum left in the food prepared with such baking powder. Now, to start with, all alums, and there are many of them, are double sulphates of sodium and aluminum, in which the sodium may be replaced by potassium or ammonia and the aluminum by iron or chromium. All baking powders are alike in that they contain bicarbonate of soda, the alkaline ingredient which furnishes the leavening gas, the gas which in escaping puffs up the bread and makes it light. Baking powders differ in the nature of the acid matters used to neutralize this soda and to free the gas. These acids may consist of cream of tartar, tartaric acid, alum, acid phosphate of calcium, or any solid acid salt, such as sulphate of sodium. Practically there are only two classes of baking powders on the market that have any great sale. They are the cream of tartar baking powder, now manufactured by the Baking Powder Trust, and the alum and phosphate baking powder. These two classes of baking powders are named for convenience cream of tartar baking powder and alum baking powder, but as a matter of fact the consumer eating food prepared with cream of tartar baking powder does not take into his stomach one particle of cream of tartar. He eats Rochelle salts.

When bicarbonate of soda and cream of tartar react upon each other in the oven the resulting substances are carbonic-acid gas, which in escaping puffs up the dough, and Rochelle salts. This Rochelle salts is the active ingredient of seidlitz powders. That is, when you eat food prepared with cream of tartar baking powder, you are taking into your stomach a quantity of seidlitz powder. Now, as to the amount of this residue, the best cream of tartar baking powder on the market contains about 28 per cent of bicarbonate of soda. To neutralize this quantity of soda 62.6 per cent of cream of tartar will be required. This quantity will leave in the food 70 per cent of anhydrous Rochelle salts, such as we find in drug stores to-day, and such as we get when we take a seidlitz powder. A teaspoonful of baking powder weighs about 200 grains, and will make 14 ounces of bread or 12 good-sized biscuits. From that 200 grains of baking powder we would have left in the food 188 grains of Rochelle salts in the bread or the 12 biscuits. That is, in that amount of biscuits there would be a Rochelle-salts residue of about 17 grains. Now, with the alum-phosphate baking powder, take an alum-phosphate baking powder of the same strength as the above cream of tartar baking powder—that is, 28 per cent of bicarbonate of soda—this soda is neutralized with acid phosphate of calcium and sodium alum. In an alum-phosphate baking powder of good quality about 20 per cent of alum is used. The balance of the alkali is neutralized with acid phosphate. The residue left in the food from the action of this powder will be a hydrate of aluminum and sulphate of soda, resulting from the decomposition of the alum, phosphate of calcium and phosphate of sodium resulting from the decomposition of acid phosphate. As far as our health is concerned, the latter may be left out entirely. Now, an alum-phosphate baking powder which contains 20 per cent of alum will leave in the food about 6 per cent of its weight of hydrate of ammonia and about 20 per cent of its weight of sulphate of soda. The best authority that has ever investigated this subject is Francis Sutton, and he determined, by experimenting on living animals, that this hydrate of aluminum was not soluble in digestive juices, and was excreted by animals in the same condition in which it was taken into the stomach, the sulphate of soda, chemically, having almost identically the same physiological action as Rochelle salts, the residue which is left after the reaction of the cream of tartar baking powder.

Now, these are the chemical facts in regard to the residue left after these baking powders are used, and as a general proposition it looks to me as just that all food products should be labeled as to what they contain and the public informed of this chemical action which takes place. When they buy baking powder made of alum they think they are getting alum, and when they buy baking powder made of cream of tartar they think they are getting cream of tartar. As a matter of fact, they get no alum in the former case and no cream of tartar in the latter case. If we caused the labeling of baking powder, it seems to me the most just way would be to require the manufacturer to print upon his label the names and amounts of substances left in the food products after the use of baking powder, so that the consumer might know that when he eats food prepared with cream of tartar baking powder he is taking seidlitz powder, and when he eats food prepared with alum baking powder he does not get any alum; he gets Glauber salts and aluminum. There is a violent prejudice in the public mind against alum-phosphate baking powder. This is kept alive by various kinds of advertising and results in benefit to some baking powder manufacturers.

Senator HARRIS. The result being practically the same, why do the manufacturers persist in using the alum-phosphate powder instead of the other; is it cheaper?

Mr. REW. Because the alum-phosphate powder retails for 25 cents a pound and cream of tartar 50.

The CHAIRMAN. You spoke of Glauber salts. What is that?

Mr. REW. Sulphate of soda.

The CHAIRMAN. Is it a coarser grain than Epsom salts?

Mr. REW. Do you refer to it in its crystallized form?

The CHAIRMAN. That is what we used to use for physicking a horse.

Mr. REW. Yes, sir. That Roehelle salt exists in the food to the extent of 70 per cent, while Glauber salts remain in the food to the extent of 29 per cent.

Senator HARRIS. Well, then, this whole theory of this chemical reaction depends upon the actual process and preparation. Suppose the conditions are not proper, then you may have absolute alum left, may you not?

Mr. REW. Well, the best answer to that is, all baking-powder manufacturers use starch to dilute their mixtures and get the gas percentage they wish. If they are going to use more alum than the soda would neutralize, they would then be adulterating or filling their baking powder with alum, and starch is a very much cheaper substance, and no baking powder manufacturer would use more alum than his soda required, for commercial reasons. If he was going to dilute with anything, he would turn to the cheapest material, which would be starch. He would probably not put in more alum.

Senator HARRIS. He might not have the exact proportion which would enable these chemicals to react.

Mr. REW. It is possible to have powder manufactured which would leave some alum if he did not have enough soda to counteract. I never have found such baking powder.

The CHAIRMAN. What is your address?

Mr. REW. 38 Michigan avenue.

The CHAIRMAN. Are you connected with any baking powder company?

Mr. REW. Yes, sir; the Calumet Baking Powder Company.

The CHAIRMAN. A notice in their care would reach you?

Mr. REW. Yes, sir.

The CHAIRMAN. I do not care to go on further to-day. We have had a continuous session of three or four hours.

The committee adjourned.

CHICAGO, May 9, 1899—10.15 a. m.

The committee met pursuant to adjournment.

STATEMENT OF MAURICE H. SCULLY.

MAURICE H. SCULLY, having been duly sworn, testified as follows:

By Senator MASON:

Q. What is your name?—A. Maurice H. Scully.

Q. What is your occupation, Mr. Scully?—A. Manufacturer of and dealer in sirups and molasses.

Q. With what house are you connected?—A. D. B. Scully Sirup Company.

Q. How long have you been in that business?—A. Since 1877—twenty-two years.

Q. That company has been in business twenty-two years?—A. I have been connected with that company for that time.

Q. Part of your business is the manufacture of sirups, I understand?—A. Yes, sir.

Q. How many different kinds of sirups do you manufacture?—A. Well, we manufacture a great many grades of sirups. Others we mix—what we call blend. It is hard to say just how many.

Q. I suppose you have a great many different names for them?—A. Yes, sir.

Q. And many sirups of almost the same quality go under different names?—A. That is it; the same price and the same quality, but different colors, possibly under different brands.

Q. About how many different ones? You have a very extensive business, have you not?—A. Well, I suppose it would be called an extensive business in our line. Of course, it is a specialty line. If you figure the grades of all brands there would be 30 or 40 grades.

Q. And a good many more than that number of brands?—A. Yes, sir.

Q. Where is your factory, Mr. Scully?—A. We are at the present time located at South Water street and Wabash avenue.

Q. Do you manufacture any sirup from the start, either cane or corn?—A. Well, we manufacture rock-candy sirup and maple sirup, which, of course, is made from the sugar.

Q. You say you manufacture rock-candy sirup, but you start out with the sugar?—A. Yes, sir.

Q. In making sugar you reach the sirup stage before you reach the sugar, as I understand it, in making sugar, originally?—A. In making the candy, yes; we boil to a liquid first, and then it is converted into candy afterwards, and then the sirup comes from the candy still afterwards.

Q. In manufacturing sirup what ingredients do you use?—A. Well, it depends, of course, on the grade of sirup, Senator. The corn sirup is mixed by adding glucose to a percentage of cane sirup. Neither of those products do we manufacture.

Q. Then when you have a blended or mixed sirup of cane and corn sirup, when you say you manufacture the sirup you mean you simply mix them?—A. Yes; in that sense, yes.

Q. Sometimes giving them a different color?—A. Yes.

Q. The committee would like to know, Mr. Scully, without going into any trade secrets, in a general way, if it can be done without injury to any legitimate part of your business, what colorings you use?—A. The coloring used in corn sirup is the cane sirup itself. There is no coloring matter added whatever. There is a larger percentage of cane sirup added to a dark corn sirup than there would be to a light corn sirup.

Q. Then, as a matter of fact, in blending these sirups and making different grades based on color, the only color used is in the sirup itself?—A. That is all.

Q. And the same of a light corn sirup—you use the lighter sirup?—A. Yes.

Q. And the same of the cane sirup, the darker sirup?—A. Yes; that is it, exactly.

Q. Now, you speak of manufacturing maple sirup. How do you manufacture maple sirup?—A. Ordinarily, maple sirup is made by

melting the maple sugar into a liquid of the proper consistency. A great deal of the sirup, however, comes right from the maple bush or sap maple. That we sell just as we get it.

Q. When you sell maple sirup, do you always guarantee that it is maple sirup?—A. A certain grade we do.

Q. Then there are different grades of maple sirup?—A. Yes; we handle three grades of maple sirup. One we guarantee to be pure, the other two we don't.

Q. Those that are pure maple sirup are marked pure maple sirup?—A. Yes.

Q. And those that are not are also marked maple sirup?—A. Also marked maple sirup. And when they go into different States that have a pure-food law the formula is printed on the outside, showing just what the ingredients are.

Q. When they don't go into a State that has a pure-food law they simply go in marked maple sirup?—A. Yes, sir.

Q. There is no formula printed on the outside, as I understand, for the State of Illinois?—A. No.

Q. You have stated what the ingredients are of the pure maple sirup. Now, I wish you would state, for the benefit of the committee—take your second grade of maple sirup. How do you make that?—A. Well, that is 60 per cent pure maple and 40 per cent glucose.

Q. Now, take your third grade of maple sirup.—A. That has a less percentage of maple and a larger percentage of glucose.

Q. That is practically all of the adulterants which you use in making maple sirup?—A. Yes.

Q. You have competitors making maple sirup all over this country, haven't you?—A. Yes, sir.

Q. Do you know of any adulterants that they use?—A. I do not. I don't believe they use any outside of glucose.

Q. You base your opinion, then, simply upon what you have heard about it?—A. Yes, and what I learn by way of observation, etc.

Q. You never heard of hickory bark being used to give it a maple flavor?—A. Not successfully. There have been a great many things put on the market as maple flavors, but none of them have amounted to anything.

Q. You think it was too easily detected?—A. Yes.

Q. Are damaged sirups or soured sirups reboiled and made over?—A. Yes; they can be reboiled and brought back to their original sweetness, or almost so.

Q. What is done with that?—A. That is reboiled and used again in a small way in other sirups.

Q. But taking a soured sirup that has been reboiled, you can't get it quite back to its original sweetness, can you?—A. I should think not, successfully; not quite so; but it can be used without being detected. I don't speak of maple sirups in this. Maple sirups, when they ferment, you can't do anything with them. You can't use them.

Q. You don't retail in your business at all, as I understand?—A. No, we don't.

Q. You furnish the trade?—A. Yes.

Q. That is, you sell to wholesalers and to merchants—retail merchants?—A. Yes.

Q. Those people who buy, do you make your sirups according to their orders?—A. No; we have certain grades which we sell for what they are worth.

Q. Well, take your second grade of maple sirup, how does it com-

pare in value with the first grade in selling? I don't care to ask for your priees.—A. About 20 per cent less in value.

Q. And the third grade?—A. Perhaps 25 per cent lower than that.

Q. So far as your experience goes, maple sirups, when they are adulterated at all, are adulterated with glucose?—A. That is all.

Q. And so far as your experience and knowledge go, they have no other adulterants?—A. No, sir.

Q. When you make a pure maple sirup you make it from maple sugar?—A. Yes, sir.

Q. Maple sirup, as a matter of fact, in making it the sirup stage is reached before it is ever turned into sugar?—A. Yes, sir.

Q. So that when you make maple sirup out of maple sugar, assuming that you have control of the product from its inception from the raw material to the finished product, you have made practically double the expense and labor when you put it into sugar and get it back into sirup?—A. Yes. The object, however, in putting it into sugar is to keep it through the summer. It keeps better in the sugar form. It will keep any length of time in the sugar form, but we could not keep the sap through the summer, and the demand for maple sirup begins in the fall. That is the principal reason why they put it in the solid form.

Q. But will not maple sirup keep if it is thick, heavy, natural sirup? Wouldn't it keep through the summer?—A. No; not very well. It will keep if it is hermetically sealed, but in the sugar bush they haven't facilities for putting it up properly.

Q. Isn't this true, Mr. Scully, that the more you refine maple sugar the less there is of that maple flavor?—A. I don't think that would apply after the first boiling. I think the sap maple has the delicate flavor of the maple, and after that I don't think it would change after that one boiling.

Q. Well, if you were to refine it clear down to the sugar, it would throw off that maple flavor entirely, wouldn't it?—A. I don't believe it would; no.

Q. You never have tried that?—A. Oh, we have melted it two or three times and found no change in it.

Q. What I mean is, when you put it to the state of granulation the sugar quality of maple sugar is practically the same as cane sugar?—A. Yes.

Q. When it is granulated. Isn't that true?—A. I don't quite catch the question, Senator.

Q. Perhaps I don't make myself clear. What I wanted to say was, if it is true, and I don't want it if it is not, that making the sap into sirup and carrying it beyond the sirup stage into the sugar stage, and then melting it back again, because you have to put water in when you melt it to take the place of the sap that has been evaporated—that in that process it may lose some of the maple-sugar flavor.—A. I think in the first operation it does, but you might follow that up afterwards and it would make no change.

Q. I see what you mean.

(The chairman here produced a can of sirup.)

Q. This is called "Golden Glory Fancy Table Syrup." Do you put up any cans like that?—A. Yes, we do, Senator.

Q. This is brought from the Davenport Refinery, Davenport, Iowa. On one side it says: "80 per cent corn sirup and 20 per cent sugar cane." You mark them, as I understand, in that way when they are sent into States which compel it?—A. Yes.

Q. But those that are sold in this State are not so marked?—A. There is no formula on that sold in this State, because there is no requirement of that kind.

Q. Mr. Scully, what do you say as to national legislation upon this subject as to uniformity, and whether there ought to be?—A. I think that is the better plan if we are to have pure food. It would be well to have them all alike. As it is now every State has different ideas, and we have to put different formulas on goods going into different States. It is very complicated and annoying.

Q. By marking differently for different States you are liable to involve yourself in trouble innocently?—A. Yes.

Q. You would be very willing to mark the ingredients on each one of your packages if your competitors did?—A. Yes; we would be very glad to.

Q. In manufacturing sirup, do you use anything in your factory besides sugar, either from corn or cane—either cane sugar or corn sugar or maple sugar, I mean?—A. No; we do not.

Q. Then, I understand, in your factory, in the manufacture of sirups, you have no deleterious substances, unless these three articles which you have named are deleterious?—A. Nothing.

Q. You have no artificial color, nothing to give it weight, or anything of that kind, except the things you have named?—A. I might say occasionally we would add a flavoring, such as vanilla flavor, or something of that kind, but in a very slight way, just to flavor certain grades. It is only to a limited extent.

Q. You put in vanilla sometimes in order to adulterate the maple sugar, don't you?—A. No; we don't use it for that purpose, but we use it in a sirup such as you have in the can there—a vanilla-flavored corn sirup.

Q. And that vanilla flavor, do you get from the vanilla bean?—A. From the vanilla bean.

Senator HARRIS. Mr. Scully, this can is, I suppose, put up to comply with the law of the State of Iowa?—A. The State of Ohio, I think.

Q. It is manufactured in Iowa?—A. Yes.

Q. What does this so-called formula mean? I don't see that that explains anything very much. As you are an expert in sirups, I would like to know what idea this would convey to you: "80 per cent corn sirup, 20 per cent sugar sirup." That is, it would be 80 per cent glucose?—A. 80 per cent glucose and 20 per cent cane sirup, which is manufactured in Eastern refineries.

Q. You speak of some flavoring matter. This is not called maple sirup. Is this sirup flavored?—A. No, that is unflavored.

Q. Would it be a disadvantage to your trade, even in States that had no law requiring it—would it be a disadvantage to you to put the statement on your cans that certain grades of your maple sirup contained glucose?—A. I think it would in this way: I think retailers would object to it.

Q. They are all sold as maple sirups?—A. Yes.

Q. And if the fact were stated that a part of it was glucose it would injure it even at the reduced price at which it was sold?—A. Yes.

Q. You make a distinction in price, of course?—A. Yes, sir. So far as we are concerned it would make no difference to us, because we sell the goods to him as they are. We don't represent to the buyer that they are pure when they are not pure.

Q. The buyer, I suppose, knows from the different prices fixed?—A. Yes.

Q. That one is pure and the other grades are more and more impure?—A. Yes, sir.

Q. But of course the purchaser buys it as maple sirup from the retailer?—A. Yes, sir.

Q. That is, supposing he is getting pure maple sirup. But your idea is that if there was a national law that compelled all to do this it would of course be just as profitable to you as if there was no distinction?—A. Just as profitable in every way. Even much better than the way it is now.

Q. It would remove the element of doubt and suspicion, and people would know just what they were buying?—A. Yes, sir.

Q. Do you regard glucose as having any objectionable qualities other than a sort of a dilution of the maple sirup itself—weakening it?—A. Do I regard it as deleterious?

Q. As having any deleterious effect whatever?—A. No, I don't.

Q. It simply weakens it?—A. That is all. It makes the flavor less strong.

Q. That is all, I believe, Mr. Scully, unless you wish to say something.

WITNESS. I have a set of samples I brought over to Dr. Wiley. He can look them over at his leisure. [Witness here produced the samples referred to.] If you will give me a moment. I brought over some samples at the request of the Doctor. They will represent the difference in colors of the same grade of goods [exhibiting the different grades]; both of the same quality, but one colored a little more by adding cane sirup.

Q. One is just as pure as the other?—A. Yes. Both are blended goods.

Q. Those are neither of them pure maple sirups?—A. No. Now, I have two samples of maple, one of which is pure and the other is not [exhibiting same].

Q. The darker one is the purer?—A. Well, there is very little difference in the colors. The darker one happens to be less pure this time.

Q. Have you a sample there of sirups which contain some of this sour sirup which has been reboiled?—A. No; there is very little of it sours. There is not a package comes back to us in two months, possibly. Perhaps in the early fall there is a little comes in from having stood over the summer. That is used up shortly, and then we have no more of it.

Q. Do you use anything in the shape of an antiseptic preservative to prevent fermentation?—A. No; nothing of the kind.

Q. Not even where you reboil sirups?—A. No; we never use anything of that kind.

Q. I remember some experiences, as a boy, in the sugar bush when we used to use soda, or something of that kind.—A. No; we do not.

Q. To neutralize the acid.—A. I see. We tried, in years gone by, salicylic acid, or something of that kind, but we gave it up because we didn't think it would do any good or be effective in any way.

Q. There is nothing of that sort used now as a preventive of fermentation?—A. No; not a thing.

Q. Which is the one which contains the greatest proportion of glucose?—A. This would be the one [indicating same].

Q. That is what percentage?—A. Forty per cent of glucose and 60 of maple.

Q. This is pure maple sirup [indicating the other sample]?—A. Yes.

The CHAIRMAN. Where do you buy that pure maple?

ANSWER. The sugar comes principally from Vermont and Canada.

Q. Do you know yourself that it is pure maple?—A. Yes; I think so. In Vermont, especially, they have a very stringent law against turning out sugar as pure when it is impure. In Canada the sugar is unquestionably pure.

Q. You say that occasionally in Vermont you have had reason to think that pure maple sugar was not pure?—A. No; I didn't say that.

Q. I beg your pardon. That which comes from Canada is sometimes impure.—A. No. In Vermont they have a very stringent law on that, so we have every reason to think that every package that comes from there is perfectly pure. In Canada we are quite sure that it is pure, because it is a very strong maple and we don't doubt its purity. Of course, we have to go a great deal upon our own judgment and taste.

Senator HARRIS. How are these two grades of sirup brought so nearly to the same color, Mr. Seully?

ANSWER. By using, perhaps, a darker maple for one and a lighter for the other.

Q. You don't use brown sugar, or anything of that kind, for coloring matter?—A. No. Occasionally we might use a little brown sugar, but not generally.

Q. They are practically undistinguishable, as far as coloring goes?—A. Yes; these samples are.

The CHAIRMAN. What is that light bottle?

ANSWER. That is rock-candy sirup.

Q. What is that used for?—A. That is used principally in soda fountains these days, for making soda water. It is also used by rectifiers in blending their liquors.

Q. Then when it is used by the soda fountains it is simply flavored and colored to suit the name of the bottle?—A. Yes, sir.

Senator HARRIS. That is the rock-candy sirup?

Answer. Yes, sir.

Q. The pure sugar?—A. Pure rock-candy sirup.

The CHAIRMAN. It is melted pure sugar, isn't it?

Answer. Rock-candy sirup is the sirup which would come off of the rock candy, out of the rock-candy pans. It is first melted and put into the rock-candy pans, and the rock candy forms on those strings.

Senator HARRIS. Crystallizes?

Answer. Yes; crystallizes on the strings, and a portion of it remains in solution after they are drawn off.

The CHAIRMAN. That is it?

Answer. Yes.

Q. Then that which we call rock candy is taken from that?—A. Yes.

Senator HARRIS. It is really the part of the sugar which does not crystallize?

Answer. The part which we don't allow to crystallize.

The CHAIRMAN. Have you any knowledge or information as to the adulteration of sugar at all?

Answer. No; I have not.

Q. You don't know anything about it. Take this powdered sugar. It is frequently reported here in the press that what is known as pulverized sugar is very heavily adulterated.—A. I have heard it so stated, by adding starch or something of that kind. Of course, I don't know anything about it.

Q. You know simply what you have heard, the same as we have heard?—A. Yes.

Senator HARRIS. Do you use any of that pulverized sugar in your business at all?

Answer. No; we don't.

The CHAIRMAN. As I understand, these samples which you have here are samples of sirup such as you have prepared them for the market?

Answer. Yes; exactly.

Q. And if I were to send an order for a barrel of maple sirup, I would get the formula of the one that was agreed upon?—A. Yes, sir.

Q. You have the three grades there?—A. Yes.

The CHAIRMAN. I think that is all, Mr. Scully. You have given us very important information.

(The samples which were referred to by the witness were left by him in the possession of the committee.)

STATEMENT OF J. J. BERRY.

J. J. BERRY, being first duly sworn, testified as follows:

Examined by Senator MASON:

Q. State your name, residence, and occupation.—A. J. J. Berry; I am connected with the Chicago Sirup Refining Company, located at 280 South Clinton street; we are in the sirup business, and we also manufacture jellies and preserves.

Q. How many different grades of sirups do you manufacture, Mr. Berry?—A. If it is permissible, I would say that we follow about the same lines that Mr. Scully enumerated here, doing business with the jobbing trade. They handle a number of varieties, some lighter colored and others dark, and they are branded according to their own names. They have their own brands.

Q. Then you manufacture for wholesalers and jobbers, using their brands?—A. Yes, sir.

Q. For instance, their trade-mark is on the outside, isn't it?—A. Yes, sir.

Q. For instance, if I had a brand that belonged to me I could go to you and say: "Send me a barrel of Golden Drips." You would know by that that you were to make it for me and of the grade I used?—A. If we had never sold to a house before we would require a sample of the goods that they wanted matched, and would brand them according to their wishes. Every jobhouse has from three to four and some five, and others even more than that, brands of sirups, as Mr. Scully stated here. Take, for instance, the light and the medium and the darker, and we would brand them differently, yet the cost and the ingredients are practically the same. More cane sugar in the darker than in the lighter ones.

Q. How many grades of maple sirup do you make?—A. Why, we list three grades. That seems to be about the requisite number of brands that will fill the demand, one pure, and one 60 per cent maple, and the other is—well, our standard grade would be 40 per cent and 60 per cent glucose.

Q. But of course you frequently make it more glucose and less sirup?—A. In this way: That you will find some people who want a maple sirup at a price.

Q. Yes.—A. In order to compete; but when I speak of our own

brands that is as low as we make a brand or grade, 40 per cent maple; but you will find some people who will want 25 per cent maple, so that they can get it at a price.

Q. I see. Then that is done upon the orders of your customers?—A. Of the buyers; yes, sir.

Q. How do you mark them?—A. Well, they are branded "pure" for the brand that is pure, and where they go into a pure-food State, such as Michigan, Wisconsin, and Ohio, we must put the formula on, giving the formula of contents.

Q. Take your second and third grades of maple sirup going to a State where they have no pure-food law. How is it branded then?—A. It is branded 60 per cent maple and 40 per cent glucose.

Q. That is where they have no pure-food law?—A. No; I beg your pardon. I didn't understand that question. We simply sell it as maple sirup there. For instance, in this State a sirup is branded "Maple syrup," and the buyer knows full well what he is getting on account of the price that he pays for the goods.

Q. That is, the merchant?—A. Yes.

Q. But the consumer?—A. Well, the consumer is misled, in my opinion.

Q. What would you say as to the necessity for a national pure-food law?—A. Why, I think it would be a grand, good thing if we had one, for the simple reason that a good many people now will buy this second grade of maple sirup because they can hoodwink their customers and sell it for a pure maple sirup, and yet the manufacturer has nothing whatever to do with that, because, in buying these goods at a stipulated price that he wishes to pay for it, it requires glucose to bring it down to the cost. In other words, maple sirup is made sometimes to fit the cost of the goods.

Q. In your opinion, those States that have pure-food laws, that compel goods to be marked for what they are, have a decided advantage over the citizens of those States—have a decided advantage over the citizens of States that don't have such a law?—A. Yes, sir.

Senator HARRIS. Permit me, Mr. Berry. Do you find that in States which have a pure-food law there is an increased demand for the pure sirup and a diminished demand for the mixtures? What is the practical effect upon the sales in those States?

Answer. The pure goods increase—the demand for the pure goods is increasing.

Q. It shows that the people would prefer to buy, even at the increased price, pure foods if they knew it?—A. Yes. I would add to that, however, that in my experience the bulk of maple sirup that is sold is a pure maple sirup.

Q. You think there is a greater proportion of pure sirup sold than of the mixed sirup?—A. Oh, yes; because people, as a rule, who eat maple sirup pretend to be judges of the quality of maple sirup, and you might sell them one can of the inferior quality, but they would soon come around and look for another one, and if they found one that was pure they would stick to it. There are a good many people, probably, who are not judges of maple sirup, who never bought anything but the adulterated goods.

Q. They have never used the high standard of comparison?—A. That's it.

The CHAIRMAN. You think that a national pure-food law which would compel manufacturers of sirups to state on the package what it is would be of benefit to the consumer and of general benefit to the

manufacturers as well?—A. Yes, sir; I do. It would be of benefit to the manufacturers in this way. For instance, I will cite a case over here in Michigan, where the pure-food commissioner, when the law first went into effect, ruled that corn sirup could be branded as heretofore—for instance, "Fancy Table Drips." Well, in a little while he ruled that it must be branded "Number 6" sirup, and later on ruled that it would have to be branded "Glucose Mixture," with the manufacturer's name on it. And it has been so in every State where they have adopted the pure-food laws. Consequently, the sirup people are compelled to keep a lot of labels on hand and change them from time to time, which has been, you might call it, a useless expense; and if we had a national food law we would simply put our formula on and it would go into every State in the Union, the same as pure goods could be sold.

Q. You also manufacture jellies and preserves, Mr. Berry?—A. Yes, sir.

Q. How many varieties of jellies do you manufacture?—A. Well, we manufacture two, Senator. One is the pure; the other the so-called "Commercial Jelly." I don't know what you call it. It is jelly.

Q. Is it marked "jelly?"—A. It is marked "jelly;" yes, sir.

Q. Then, that you make that is pure you make from the fruit juices?—A. We make that from the fruit juices and sugar—the same as people at home would make their jellies for their own consumption.

Q. For instance, the fruit juices; if you were making a pure apple jelly you would make it of cider, would you? How would you make it?—A. No.

Q. Take a pure apple jelly?—A. The apples would be boiled, and the liquor that comes from it would be condensed to the proper consistency and equal parts of sugar mixed with it. That would give you a pure apple jelly—that is, absolutely as pure as you can make it. But I consider it better than to make it of apple cider, because it is more transparent, and it has a more delicate flavor. So with currant juice.

Senator HARRIS. Mr. Berry, do you make an apple jelly at all? Is there any apple jelly made in your establishment in the way that you have indicated?

Answer. Yes, sir.

Q. You do make some of that kind?—A. Yes, sir; but the demand is very limited.

Q. The great bulk of the so-called apple jelly is made in other ways?—A. The jelly as sold is consumed by the masses, and they want jelly at a price. They don't care whether it is jelly or not.

Q. They have got to have it so that they can buy it?—A. Yes; that is it.

The CHAIRMAN. Then this adulterated or commercial jelly is a good deal cheaper?

Answer. Yes, sir.

Q. Do you retail that at all?—A. Why, no, sir; we confine ourselves entirely to the jobbing trade.

Q. How do you mark that jelly which you call adulterated or commercial jelly?—A. In the State of Illinois, for instance, and other States where there are no pure-food laws, we simply put a label on there, "Currant Jelly," "Raspberry Jelly," etc.

Senator HARRIS. I suppose that commercial jelly is the base of a great variety of jellies, isn't it?

Answer. Yes, sir.

Q. And they are flavored and colored?—A. They are simply flavored.

Q. You have the common base, and then you make almost any variety?—A. Yes, sir; almost any variety.

Q. What is the exact character of this commercial jelly, this basic jelly?—A. It is made from what we call cores and skins. Where they do the evaporating of the apple, parings of the apples and the cores are evaporated in the same way that they evaporate apples. That part of the apple contains the jelling properties of the apple, and being evaporated it will last from one year to the next. Then it is mixed with glucose and a small proportion of sugar. I consider the jelly wholesome. It is 50 per cent glucose, 10 per cent sugar, and 40 per cent apple juice.

Q. But it is weakened by the glucose and lacks flavor and color?—

A. Yes, sir; the glucose is put in to give it body, being heavy.

The CHAIRMAN. Do you use any gelatin in producing the gelatin part?

Answer. No, sir.

Q. You have competitors in your business, have you?—A. Yes, sir; I think all the sirup houses are manufacturing the jellies nowadays.

Q. Do you use in your factory any acids in making this jelly, outside of fruit acids?—A. In the jelly?

Q. Yes.—A. Yes, sir.

Q. What acids are used?—A. Well, it is a combination that we buy from a concern which prepares it. I don't know the combination, but it is perfectly harmless. I say this from the rulings that have been made over in the pure-food States where samples have been submitted with this acid in the jelly. I am not a chemist, so I am unable to—

Q. You do not know the technical term of the acid that is used?—A. Why, no. They give this a name. The concern got up this combination of acids and submitted it to the different houses to put into jellies to submit it to the pure food commissioners in Michigan, Ohio, and these other States, and they have accepted that as filling the bill.

Senator HARRIS. What is the object of the acid?

Answer. The object is to make the jelly more firm. It takes but a very small trifle in each pail.

Q. Has it any antiseptic feature at all, or is it intended for that?—

A. No, sir; I don't think that is required in this ordinary jelly. I have seen some that has been out for a year.

Q. The old-fashion domestic jellies do ferment sometimes, I believe, don't they?—A. Yes, sir; I think they do—

Q. When they are not sufficiently cooked, I suppose?—A. I think the trouble lies in the making of it, when it ferments.

The CHAIRMAN. What acid do you use to give the tart taste of the fruit to it?

Answer. It is imparted from the apple juice, and being made with only 10 per cent sugar, it does not overcome this tartness that is imparted by the apple juice. The glucose, while there is a certain sweetness in it, it is not powerful enough to penetrate.

Senator HARRIS. It would seem to me that plain, simple, apple jelly has very little tartness, and that in order to make currant jelly you would have to do something to give it a little more pronounced tartness.

Answer. No, sir; we do not use anything to give it a more pronounced sharpness, as you call it—simply a little flavoring, and the people go largely by the label on the pail, in my opinion.

Q. If they look at the label while they are eating it, they would

think it was the kind of jelly designated by the label?—A. They can eat currant jelly if it says currant jelly on the label; yes, sir.

Senator HARRIS. Great is the power of the imagination.

The CHAIRMAN. Then, so far as you understand, this acid that is used—is that used to give that sharp, sour, or tart taste to it, or is it used to give it firmness?

Answer. To jell it, as we call it. Ordinarily jelly will not jell for some time—that is, the so-called homemade jelly. They usually allow it to sit over night before they consider it well jellied, while our jelly will be jellied in a few hours as well as it ever will. Here is a tablespoonful put into a 30-pound pail.

Senator HARRIS. That is by the addition of this acid?

Answer. Yes, sir.

The CHAIRMAN. What size of pails are used?

Answer. It is put up in 15 and 30 pound pails.

Q. You can make a pail of jelly, of what is known as commercial jelly, for instance, if you are going to market currant jelly, of 10 per cent of sugar, 50 per cent of glucose, and where do you get the other 40 per cent when you do not use currants?—A. The apple juice.

Q. You use apple juice to make currant jelly?—A. Yes, sir; the apple juice—

Q. Is that the base of the whole thing?—A. The apple juice and the glucose is the foundation of the whole business.

Q. You were asked just now if the flavor is practically the same?—A. Not in currants, Senator. The currant jelly is flavored and colored.

Q. So that it tastes a little different and looks different?—A. It looks different. There is a little coloring matter put into this to make it a bright red.

Q. What coloring matter do you use?—A. Well, we are now using an imported coloring matter that is guaranteed to us to be perfectly harmless—a vegetable color. In the olden days they used aniline, which of course is poisonous.

Q. This that you get, though, is guaranteed to be a vegetable coloring matter?—A. Yes, sir.

Senator HARRIS. You do not know what the composition of it is?

Answer. No, sir; I do not. We like the acid as used now in the State of Ohio, where I can sell colored jelly with the formula on. In the State of Michigan we sell it uncolored and it is branded there "Imitation Fruit Jelly," and is without any coloring matter in it at all. The food commissioner in Ohio did not object to this vegetable colored jelly, but passed on it as being satisfactory.

Q. You stated that there were some States that had made a chemical analysis, as I understand you, and had accepted this acid as not deleterious?—A. Yes, sir.

Q. Did they specify what that acid was? Did they give it a name?—A. No, sir; not that I know of. Several years ago the concerns in Chicago in the jelly business sent a man over to Lansing, Mich., to go over this question of jellies, and the result in the end really was that this acid was acceptable, but the jelly must be uncolored.

Q. Really in your manufacture you use, then, two articles that you simply use on faith yourself, this acid and the coloring matter. You do not exactly know what they are, but you believe, or you are guaranteed, that they are harmless?—A. Yes, sir.

Q. Why did the Michigan people object to the coloring matter?—A. Well, I am unable to say; but, as I said a while ago, they made a ruling and then they changed it in a little while, and finally they have

got to the point now where jelly must be uncolored, and that is there final and last ruling. These food commissioners do not usually give you a reason. We had a lot of colored jelly over in the State of Michigan, I think, a year ago; that had been sold before they ruled on coloring matter having to be left out of the jelly, and we were notified that we must take this jelly from the jobbers. The jobbers notified us that we would have to exchange it for uncolored jelly. We wrote to the food commissioner, explaining that those goods had been sold before this new ruling, and that it would incur considerable expense to pick it up from one end of the State to the other; but his answer was, "I send you a copy of the law; act accordingly." And we simply had to pick up our jelly and exchange it for uncolored goods. I say that to show you that there is no way of getting any explanation from the food commissioners.

Q. They lay down the law without any explanation. You think that these aniline preparations are not used now for coloring jellies?—A. Well, I don't know positively as to that, but I have reason to believe that in a large measure they are not used any more. Some concerns may use them.

Q. But you do not?—A. No, sir; we have not for the last five years.

The CHAIRMAN. This article that you say is guaranteed to you to be a vegetable coloring matter, is it practically as cheap as aniline?

Answer. No, sir.

Q. It is not as cheap?—A. No, sir.

Q. Is there such a difference in the cost of the coloring that it would be a temptation for a manufacturer to use aniline instead of this?—

A. Well, I don't think there would be, Senator; not sufficient to a man who had any regard for the welfare of the public at large.

Q. You are not a chemist, Mr. Berry?—A. No, sir.

Q. And you have no personal knowledge as to what this vegetable coloring matter is?—A. No, sir.

Q. Except that it has been passed upon by some food commissioners and held not to be deleterious?—A. That is it.

Q. And you have continued the use of it since then?—A. Yes, sir.

Q. Would your opinion apply the same to jellies as it does to sirups—that there ought to be a national pure-food law which would make uniform rules for branding the goods?—A. Yes, sir.

Senator HARRIS. In the manufacture of preservatives, Mr. Berry, is there any difference in the manufacture of preservatives other than as indicated in the manufacture of jellies—what you used in preservatives is glucose and some of these coloring matters?

Answer. Yes, sir.

Q. With perhaps a little flavoring or something of that sort?—A. No, sir; in preservatives we put in the fruit without the flavoring.

Q. The fruit is sufficiently flavored?—A. Yes, sir; the fruit is sufficient without the flavor.

Q. Where do you get your fruit, then?—A. We put up our fruits during the different seasons.

Q. The local market supplies you?—A. We get fresh fruit from the market and put it up in hermetically sealed cans for use during the winter season.

Q. You get as good fruit as you can, I suppose, exercising all the care possible?—A. Yes, sir. The fruit is perfectly sound fruit.

Q. Perfectly sound fruit?—A. The time to buy that fruit, of course, is when there is a flood in the market, and you can go down on the

street and buy the best fruits at a nominal price, of course, when the market is flooded.

Q. You will watch your opportunities in that way?—A. Yes, sir.

The CHAIRMAN. How many drops does it take to color, say, a gallon of the jelly?

Answer. Well, we use an ounce of this coloring matter to 50 gallons, and it is dissolved in water. A solution is made of the dry powdered form. To a pound of this coloring matter there is a gallon of water added, and we use an ounce of this preparation for 50 gallons.

Q. You would have no objection to giving the committee a small sample of that coloring matter, would you?—A. No, sir; I would be very glad to bring it over here to you.

The CHAIRMAN. Thank you.

STATEMENT OF C. S. N. HALLBERG—Recalled.

C. S. N. HALLBERG, having been previously sworn, was recalled and further testified as follows:

Examination by the CHAIRMAN:

The CHAIRMAN. You are a chemist by profession?

Answer. Yes; I am not a chemist, except a pharmaceutical chemist. I do not know as I have much to add to what I said yesterday except, possibly, that I simply incidentally referred to the statement which was made by the preceding witness, Mr. Murray, who stated that if the alum in the baking powder were properly neutralized there would be left no alum in the finished bread. I stated in my testimony that that was not true. Of course I did not qualify the statement that the alum was in the form of aluminum hydrate. I wanted to escape, as much as possible, these chemical and technical terms. I also incidentally referred to the fact that Dr. Wiley had stated that he regarded alum as an irritant poison, not, however, at all to be likened to such substances as are commonly known as poisons, such as strychnine. Mr. Rew, who followed me, stated that he desired to correct this statement of mine, and gave a very elaborate exposition of the chemical reactions involved in the various kinds of baking powders, and showed conclusively that the alum baking powders left a residue of aluminum hydrate. That is exactly what I had in mind, and I hope that Mr. Rew will give me sufficient credit, at least, as a sort of chemist, to know that that is what I had reference to. I do not believe that it is within my province to discuss whether or not this aluminum hydrate remains as such in the stomach when the bread is eaten. I think that there will be other witnesses who will have much stronger evidence with which to support their statements in that respect than I have.

I also stated that this question was not as yet settled—that is, the question as to the character of aluminum as an ingredient in baking powder. I know, and everyone who has studied this question knows, that authorities differ; but it is a remarkable condition, perhaps, that experts can be found to assume any view that the employer desires. Recently the greatest expert, perhaps, not in an official position—that is, with the Government—I think it is Professor, either Atwater or Professor Chittenden, of Yale—has differed very materially with other experts with reference to the use of antiseptics and anti-fermentatives in food, one of them even making the broad assertion that such a powerful antiseptic or anti-fermentative as boric acid was compara-

tively harmless. So that this question of the use of certain additions to foods and food products is a very intricate and difficult question to solve; and, as I suggested yesterday, it can only be done by the most careful and elaborately planned research by scientific men, who have devoted their lives to the study of this subject to fix the various limitations as to the use of certain substances which we know by themselves are harmful, but under certain conditions may be permissible.

As comes before your honorable committee in reference to nearly every subject, you have no doubt observed that concerning syrups, concerning this maple sirup, and this morning concerning jellies, the question always comes up if there are substances that are used to give a certain artificial effect to a substance, to simulate the natural qualities and properties as to taste, color or odor; and to what extent this can be used is an exceedingly difficult question, especially when you consider that men like this immediately preceding witness, Mr. Berry here, who evidently understands his business, but at the same time frankly confesses that he does not know anything about the composition of these two exceedingly important substances, two substances which are trade compositions, trade products. That means, perhaps, that the composition is secret. It means, probably, that either the processes by which they are made are patented or the names are copyrighted. It means that those manufacturers can change or modify the formula, and therefore the constitution of these substances, whenever they take a notion to do it. So he may have the very best of intentions, and nevertheless he may be using sulphuric acid in this acid compound in jelly. I have been credibly informed that it is sulphuric acid that is used, although I don't know. I wouldn't say, but I have heard it from persons—

The CHAIRMAN. You may remember Professor Wiley's statement that some stomachs would be more susceptible, and others, strong and healthy, might take this without notice where a weak or delicate stomach might immediately become ill from absorbing things of this kind. Well, I called you, Professor, because he followed you in the statement, and I wanted to know whether you had changed your mind any in regard to it since he testified.

Answer. No, sir. I think Mr. Rew will agree with me that we are both right on that. I don't think there can be any misunderstanding about it. It was purely a technical omission, for reasons which I have already given, which led me to state that there was alum remaining, it being aluminum hydrate. If I am allowed, I want to say that alum—that is, the base aluminum—and its compounds are not volatile. Consequently, they can not volatilize. When aluminum carbonate is used in baking powder—aluminum carbonate is made up of two volatile substances, ammonia gas and carbonic acid, and, by heat, under favorable conditions they will both volatilize; but such is not the case with aluminum compounds or any of those fixed bases.

I don't like to detain the committee at all. I can talk as long as you please, almost, on this subject; but I don't want to interfere with anyone.

The CHAIRMAN. That was the only question I had to suggest. I wanted to know whether you changed your views after hearing Mr. Rew. Is Mr. Rew present?

Mr. REW. Yes, sir.

The CHAIRMAN. Do you want to say anything to the committee?

STATEMENT OF GEORGE C. REW—Recalled.

GEORGE C. REW, having been previously sworn, resumed the stand and further testified, as follows:

Examination by the CHAIRMAN:

Q. Your name is George C. Rew?—A. Yes, sir.

The CHAIRMAN. Your address?

Answer. 38 Michigan avenue.

The CHAIRMAN. And your business?

Answer. I am vice-president of the Calumet Baking Powder Company.

The CHAIRMAN. If there is anything that you want to say in regard to this matter, the committee will hear you.

Answer. Strictly speaking, when we use the term "alum" to describe a chemical compound we mean a definite substance or a definite class of substances. That is, we mean a double sulphate of an alkaline metal—aluminum; and when Professor Hallberg said yesterday in food prepared with properly mixed alum baking powder there would be some alum left in the food, I questioned the statement, because alum is this definite double sulphate, and the substance left in food prepared with an alum baking powder is hydrate of alumina and sulphate of soda, neither of which substance is alum. Alum may be manufactured out of those materials, but they are not alum, and the alumina, or, rather, the aluminum which results from the decomposition of the alum in the process of baking in this form of aluminum hydrate, is not soluble. It is an insoluble compound; whereas, aluminum, the double sulphate, is readily soluble in water and in the digestive juices, and, if taken into the stomach as such, would have all the physiological action which the soluble alum compounds have, while, taken into the stomach as hydrate of alumina, it is insoluble in the digestive juices. I am not a physiologist, and I say that only on the authority of physiologists.

The CHAIRMAN. In the processes of digestion is the stomach alkaline or is it acid?

Answer. As I stated before, I am not a physiologist; but the stomach contains 1 per cent of hydrochloric acid, I think.

The CHAIRMAN. Is aluminum hydrate a soluble acid?

Answer. The best authority, so far as my knowledge goes, on that question is Francis Sutton, the English analyst; and in the English case, known as the Norfolk Baking Powder Case, he was the chemical expert who testified, and the burden of his testimony was to the effect that this aluminum hydrate was not soluble in the digestive juices.

The CHAIRMAN. Then it is not soluble in hydrochloric acid?

Answer. Yes, sir; it is soluble in hydrochloric acid, but not in the hydrochloric acid of the stomach, according to Sutton's testimony. The solution either is weak or about 1 per cent strength.

The CHAIRMAN. Is the Professor right when he says it is not volatile?

Answer. Yes, sir.

The CHAIRMAN. That is a correct statement?

Answer. Yes, sir.

The CHAIRMAN. That is all—unless you have something to say.

The WITNESS. There is something I wanted to say along the same line as yesterday. I suggested that the best way to get at these labels for baking powders—the most fair way—would be to label the baking powder in accordance with the materials left in the food; that is, the

substances which went into the stomach of the consumer; that it is not a matter of any interest to the consumer to say that this baking powder contains cream of tartar if the consumer doesn't eat any of the cream of tartar. If the substance which went into the stomach was Rochelle salts, that was the substance about which the consumer was entitled to information.

The CHAIRMAN. Yes; I remember that.

The WITNESS. And the same way with the alum baking powders. I have brought with me a sample of these Rochelle salts, which I have extracted from food prepared with the cream of tartar baking powders [producing same].

Senator HARRIS. On that point could anything definite be said as to what would be taken into the stomach?

Answer. I couldn't state it exactly.

Senator HARRIS. Wouldn't that depend on the cooking?

Answer. Not as far as the baking powder was concerned.

Senator HARRIS. Wouldn't it depend upon the quantity used?

Answer. Suppose we have a cream of tartar baking powder which contained 28 per cent of bicarbonate of soda. That, with the quantity of cream of tartar necessary for neutralizing, would leave in the food 70 per cent of the weight of the baking powder used of Rochelle salts. Why couldn't that baking powder be replaced by this baking powder, leaving in the food 70 per cent of its weight in Rochelle salts?

Senator HARRIS. I asked the question because I have an unpleasant recollection of a great variety of soda biscuits that I have eaten in the course of my life. You may assume that soda, using the proper quantity, would have a certain effect if you had a certain amount of it in the stomach. I have seen soda biscuits of all shades and colors, from pea-green to a very dark-brown taste.

The WITNESS. Yes, sir; those soda biscuits are prepared by the cook. She uses saleratus baking soda and sour milk. She has no way of determining the degree of sourness of the milk. It may be at one time very acid, and at another weakly acid. She uses a uniform quantity of soda and an indefinite quantity of sour milk. If she uses more soda than her sour milk will take care of, the biscuits are yellow; if, on the other hand, she uses too little soda or too much milk, then the biscuits are white and bleached.

Senator HARRIS. No such possibility would attend the use of your baking powder?

Answer. No, sir; because our baking powder is prepared on chemical lines.

Senator HARRIS. I mean the quantity ought to be precise and accurate.

Answer. The residue would be the same whether you used two teaspoonsfuls or one to a quart of flour.

The CHAIRMAN. I have here a label signed by the Calumet Baking Powder Company, Chicago. Professor Wiley and the committee would like to know whether that is one of your labels [handing same to witness].

Answer. Yes, sir; that is part of one of our labels.

The CHAIRMAN. That label, so far as it goes, is complete in itself?

Answer. That is the reverse side of one of our labels.

The CHAIRMAN. There are other things on the can besides that?

Answer. Yes, sir.

The CHAIRMAN. But that is on each can?

Answer. Yes, sir.

(The chairman then read the label referred to, as follows: "One

thousand dollars will be given for any substance injurious to health found in Calumet baking powder. No baking powder on the market will produce as light, sweet, healthful food, entirely free from alum, Rochelle salts, lime, or ammonia, as Calumet baking powder. This baking powder contains alum manufactured with the greatest care especially for us from pure criolites. This is not the alum of the drug stores, and in the process of baking is completely changed, so as to leave in the food no substance injurious to health. Calumet baking powder complies with the pure-food laws in all the States, and its purity has never been attacked by any board of health. Grocers are authorized to guarantee it in every respect." Then follow the directions in English and German. Signed "Calumet Baking Powder Company, Chicago."

Senator HARRIS. What is the object of introducing that, Mr. Chairman?

The CHAIRMAN. Professor Wiley or Professor Mitchell asked me about—I don't know that it is necessary to put it in the record. They asked me to ask him if it was one of his labels. That was all.

Senator HARRIS. I have no particular objection to it. The label states that no alum is used.

The CHAIRMAN. No; it says it is not drug-store alum. They say it is alum, but it is not drug-store alum, and that in the process of baking it is completely changed.

Senator HARRIS. But when it is used it is not changed.

The CHAIRMAN. The witness has answered that, I believe.

The WITNESS. I have been over that ground.

Senator HARRIS. Yes; I was simply referring to what you had already said.

The WITNESS. That is simply a brief statement or summary of some of the statements I have made.

The CHAIRMAN. Is this label intended to inform the consumer that it does contain alum?

Answer. It is to assure the consumer that the substances left in food prepared with our baking powder are not injurious; rather to show what is not there more than anything else.

The CHAIRMAN. Is it intended to show that the baking powder in itself contains alum?

Answer. That statement appears there; yes, sir.

Senator HARRIS. The direct purpose is to show that under your theory the alum used is not injurious.

Answer. Yes, sir; that that alum is entirely destroyed in the process of baking, as alum—

The CHAIRMAN. And that by the process employed by your company the alum, which is admittedly used by your company, is not injurious to health, owing to its chemical reaction?

Answer. And that none of it is left in food prepared with our baking powder.

Senator HARRIS. That is your side of the case.

STATEMENT OF PROF. A. S. MITCHELL.

Prof. A. S. MITCHELL, being first duly sworn, testified as follows:

Examination by the CHAIRMAN:

Q. What is your name?—A. A. S. Mitchell, of Wisconsin.

The CHAIRMAN. What is your address?

Answer. My home is in Milwaukee, but my business address is Madison.

The CHAIRMAN. What is your profession?

Answer. I am an analytical chemist, chemist to the Dairy and Food Commission of Wisconsin.

The CHAIRMAN. Have you had any special course of study in this matter?

Answer. Yes, sir; I graduated from the chemical department of the University of Michigan in 1887.

The CHAIRMAN. How long have you been engaged in this work?

Answer. I have been engaged in analytical work since 1887, but I have been with the Food Commission over four years.

The CHAIRMAN. Do you hold now an official position in Wisconsin?

Answer. Yes, sir; I am a chemist of the Dairy Commission and of the State board of health.

The CHAIRMAN. Before I take up the general subject which is before us—Mr. Rew having just been on the stand—I will ask you if you ever had occasion to analyze or know anything about baking powders?

Answer. I have analyzed several.

The CHAIRMAN. What do you say as to the use of alum in baking powder?

Answer. It is a questionable subject. There are two sides to it; but I think at least the public ought to be informed, plainly informed, when they are buying an alum baking powder. Then if they care to use a cheaper baking powder, containing alum, they would be at liberty to obtain them. But the trouble with them as now sold is that the alum baking powders are sold under either deceptive labels or not labeled at all in reference to the composition of them, and while they are sold by the wholesaler at very low prices, they frequently reach the consumer at prices as high as the cream of tartar baking powders, and very frequently then there are prizes given with them, and supposed to be given for nothing. The commission ordered the arrest of one party in Milwaukee who sold two samples of baking powders to the inspectors, one for 20 cents a pound and labeled 20-cent baking powder, with a prize, and the other labeled best baking powder, with a different label, but identically the same powder inside the can, the cans the same weight; the one marked "Best" sold for 50 cents, and a china dish was given with it.

The CHAIRMAN. In that way the consumer—

Answer. Is deceived and defrauded, at least, and it is a question whether he is not injured. I have a sample of the deceptive labeling which was used, and the alterations which have been made by our laws.

(The witness here produced the sample referred to.)

The WITNESS (continuing): There [indicating] is a sample which was sold with this label, just as it is seen, before the law, without this black printing on the side. Shall I read the label?

The CHAIRMAN. Yes.

Answer. The top of it says: "Delicatessen," and there is the strength given. Then, without punctuation, "Warranted cream of tartar baking powder company, New York, U. S. A.," and the careless reader would read, "Warranted cream-of-tartar baking powder," and the word "company" being on the lower line. On the side it says, in larger letters, "Strictly pure cream of tartar," and in smaller letters on each side of it it says, "How to make." Then it reads, "Strictly pure cream of tartar;" in small letters, "baking powder;" and then

it gives the formula which would make a cream-of-tartar baking powder. There is no cream of tartar in this baking powder, and the name of the company marked on it is "Cream of Tartar Baking Powder Company, New York, U. S. A." It is made in another State than New York—in Ohio, I think. The Wisconsin law requires that this powder be branded as containing alum. So, to comply with that law, they have left their deceptive label on the side and top, but they stamped along the side, in black letters, "This baking powder contains alum." There is no cream of tartar in it, and it is an alum baking powder. That is one of the most flagrant cases. They are not usually as bad as that.

Senator HARRIS. The black printing was put on specially for use in your State?

Answer. Yes, sir; that is just to make it comply with the law in our State; otherwise the label would remain the same.

Senator HARRIS. And elsewhere it probably goes without it?

Answer. Yes, sir.

The CHAIRMAN. Did you analyze this?

Answer. I did.

The CHAIRMAN. It does not contain any cream of tartar?

Answer. It does not.

The CHAIRMAN. And it does contain alum?

Answer. It does.

The CHAIRMAN. It was never marked "alum baking powder" until your State passed the law?

Answer. Never, to my knowledge.

The CHAIRMAN. Have you anything further to say upon this particular subject? I wanted to start with you with some little system.

The WITNESS. The question of the wholesomeness of baking powders, while it is an important question, as, in that case, there is a fraud committed in selling the cheaper substances for the more expensive ones; and if the question of wholesomeness was entirely out of it, the desirability of labeling it alum is undoubted. There are good men who adhere to that belief. The amount of chemical impurities there which would remain in the food would be small, but their tendency is deleterious. There is no question about that. In the first place, the claim is frequently made, and has been made before this committee, that when these baking powders are used in the food the reaction is complete and no alum remains in the food. I have failed to find any baking powder which, in the ordinary process of cooking, would perfectly react and not leave some soluble alum, even when there is no flour or food put with the baking powder, but simply warm water. The hydrate of alumina—of course, there is no question but that this hydrate is soluble in diluted acids if the stomach is in its normal condition—in my opinion, the hydrate would be more or less soluble as a chloride, and it would be at least liable to absorption, and the tendency would be to act as an astringent, and as possibly a mild irritant, and the tendency is as a drug or chemical and not as a food.

The CHAIRMAN. If you had your choice as to whether you would take an alum baking powder or a cream-of-tartar baking powder for your own use, which would you choose?

Answer. I would use either a cream-of-tartar or phosphate baking powder without the alum. I wouldn't want alum in my food knowingly. May I add a word?

The CHAIRMAN. Yes.

The WITNESS. There is a sale for the alum baking powders, espe-

cially where stores are supplying boats and supplying large concerns, where they have got to make a showing of low cost of the products which they buy, and the more economical the steward can be in buying, the better steward he is in the eyes of his employers; and so there is a large sale for the cheaper forms of baking powder where they are used in public places.

The CHAIRMAN. Hotels and boarding houses?

Answer. Hotels and boats and boarding houses, trains, etc.

The CHAIRMAN. The man who buys at retail at a table has no information at all? It is impossible, when you sit down to eat a meal, for you to tell what you are getting?

Answer. He has no way of informing himself, and he may have a prejudice against using those astringents. If he does, he should have the right to be protected.

The CHAIRMAN. Can you think of any way, since you have given this subject of pure food your attention—can you think of any way, as a matter of law, by which the purchasers and consumers at these great hotels and restaurants can be protected, so that when they think they are buying, for instance, butter, they get butter, and when they think they are buying cheese, they may get cheese, and when they think they are buying a bread made of flour, they may get it instead of getting flour mixed with cheap adulterants, and the same with honey?

Answer. I can not as long as they are permitted to sell them, and as long as they are permitted to be sold on the market the stewards will get them. It will be almost impossible to inform their guests through bills of fare or otherwise, and legally. It is done in the case of butterine in many places, either by means of the bill of fare or by signs.

The CHAIRMAN. In what State is there any such law as that?

Answer. In the State of Wisconsin notice to guests is required, but it is not stated how that notice shall be given. Sometimes it is given on the bill of fare and sometimes by signs, and usually the effort is to get the sign in a rather out-of-the-way place.

The CHAIRMAN. That is the law there now?

Answer. That is the law there now.

The CHAIRMAN. So that if I was prejudiced against oleomargarine and I went into a hotel I could see by the sign whether they used it on the table or in their cooking?

Answer. I think you could. I think there are only a few places in the lumber region, in the northern part of the State, where that law is not in force. It is in force in all the larger cities in the southern part of the State, strictly enforced.'

The CHAIRMAN. You have made a special study of food products and of dairy products, have you not?

Answer. Yes, sir; I have made a study of the chemistry of them.

The CHAIRMAN. What is the title of the place you now hold in the State of Wisconsin?

Answer. I am the chemist of the dairy commission, and I do the chemical work of the State board of health through my official position.

The CHAIRMAN. Then you take up other foods besides dairy food products?

Answer. Yes, sir; foods in general, preservatives used in foods, and spices.

The CHAIRMAN. You are familiar with the working of the oleomargarine law?

Answer. Yes, sir; fairly.

The CHAIRMAN. Have you any suggestions as to any improvements that could be made to protect the consumer and the honest manufacturer of butter?

Answer. We feel very well satisfied with the law which prohibits the coloring of oleomargarine in imitation of butter, and in the same way we would like to extend that, in a measure, to all products which are artificially colored in imitation of other substances, the artificial coloring in itself not being objectionable unless it is used to conceal the actual character of the goods made in imitation of other substances.

The CHAIRMAN. Would you recommend to the National Legislature a law that would prohibit the coloring of oleomargarine?

Answer. I think it would be desirable.

Senator HARRIS. And would you recommend a law which would prohibit the coloring of butter?

Answer. Well, that goes into the other question as to whether coloring in all cases of food products should not be prohibited. The objection is not so great there, because butter is not colored in imitation of anything else.

Senator HARRIS. The moral element does not enter into it, you mean?

Answer. Yes; coloring which pleases the eye, in a measure. Such coloring as is used in confectionery, in brightening up certain dull-colored foods, is not as objectionable, providing you get coloring that is practically harmless.

Senator HARRIS. And the objection to the coloring in oleomargarine is that it assists in the deception?

Answer. It assists in its use as butter, in deceiving the customer; the use finally.

Senator HARRIS. And particularly the customers in these great hotels and restaurants and boats that you have described?

Answer. Yes. If it is white, like lard, they suspect it, and then they notice its greasy consistency, its lack of grain, and its tallowy taste. It aids the officers in searching it out readily, too.

Senator HARRIS. You have no other suggestions as to the amendment of the oleomargarine law except as to the color?

Answer. No, sir.

Senator HARRIS. How about filled cheese?

Answer. Filled cheese in our State is well regulated by the taking effect of the national law, which did the work. Our State has a prohibitory law, affecting only the State. There are no factories in our State now. There were, when this law went into effect, 200 factories running in our State alone.

Senator HARRIS. Making filled cheese?

Answer. Yes, sir.

Senator HARRIS. This filled cheese is not necessarily deleterious to health, is it?

Answer. Not necessarily; but it is a much inferior product to oleomargarine from a food standpoint, and does not ripen normally, and it soon breaks down and spoils. It is not a permanent or desirable imitation of cheese.

Senator HARRIS. Have you any suggestion to make to this committee as to the amendment of the law in regard to filled cheese—the national law?

Answer. No, sir; in my opinion, so far as I know, it is satisfactory.

Senator HARRIS. Take the bill known as the "pure-flour bill," which

has been lately passed, which compels the stamping of flour that is sold as wheat flour when it contains anything besides wheat. Have you any suggestion as to any amendment to that?

Answer. I have not. I think that the national laws do more than local legislation, and that law seems to be doing its work. I have not much personal knowledge of the adulteration of flour except buckwheat brands and fancy brands.

Senator HARRIS. Before we take up the general discussion of pure food with you, what is your opinion as to the propriety of having a national law, a uniform law, which would compel the marking of substitutes, of what they are?

Answer. I think it is very desirable. It would form a basis for legislation in the various States, so that there will be a tendency to uniformity. Everything will be as good as the national law requires, and in some States they always have the privilege of going a little further, provided they can enforce it locally.

Senator HARRIS. If you will start in now and state to the committee on any subject—what we want is to get all the information we can. Our resolution instructs us to investigate what adulterants are deleterious to health and what adulterants of foods are simply frauds and not necessarily deleterious to health. You can divide it as you like.

Answer. From a sanitary standpoint, of course the deleterious ones come first. It seems to me that the rapidly growing use of preservatives and antiseptics is about as important a thing in that line as I have met with.

Senator HARRIS. What is an antiseptic?

Answer. An antiseptic is a substance which will stop the development of a germ or bacterial life, fermentation in a general way—stop its development and growth.

Senator HARRIS. Can you state to the committee how it is used—in what foods it is used?

Answer. Yes, sir; I have a few here, some of them sold in this city, which we have met with. I take up dairy products first, or first, rather, I will make a general outline, perhaps. Antiseptics or anti-ferments are used in dairy products—in milk to some extent, to some extent in butter and in cream, both simple antiseptics and antiseptics also which are rich in consistency, apparently rich in cream, and in that connection also with coloring matter, to give an appearance of yellowness and richness. They are used to some extent in ordinary foods, to a considerable extent in candy, and in that connection some substances are used which are deleterious as well; and they are used a great deal in chopped meats, such as Hamburger steaks and such as sausage. They are used in bulk oysters and in fish, in the brine of some cured meats, such as hams, and possibly corned beef. They are recommended by sellers for use in almost every conceivable food that will spoil, and they are recommended almost universally as being harmless, and, as a greater temptation, for the almost utter impossibility of detection by chemists. That is generally quoted by the dealers, as it is on this bottle [referring to a bottle on the table].

Senator HARRIS. You say the rule is that these antiseptics are deleterious to health?

Answer. In my opinion, any antiseptic which is an active antiseptic is necessarily deleterious to health.

Senator HARRIS. Because it stops the processes of the stomach?

Answer. It does retard them to some degree, undoubtedly. It stops the working of the normal enzymes, or ferments, and it stops the

digestive processes which take place in the organs, and it stops, in a measure, the changes which take place normally in the food products, possibly, in some cases. This material here [referring to a sample] is sold as freezine, and it is said to take the place of ice. It goes on with an apparently scientific exposition of what sours milk, and it says that its use does not affect the flavor or fresh appearance of milk, cream, or buttermilk in any way. I do not think I need to quote from this label. It simply states that it does the work of ice, and that is the reason that they call it freezine; and it is a solution of formic aldehyde.

Senator HARRIS. Did you analyze that yourself—the contents of that bottle?

Answer. I did, a portion of it, and found it to be formic aldehyde.

Senator HARRIS. In your opinion, that article is highly objectionable from a sanitary point of view?

Answer. Yes, sir.

Senator HARRIS. That is, it is absolutely deleterious to public health?

Answer. Yes, sir; it is when used in strong solutions; not in the very weak strength in which it would be held in milk, of course, but it is used in strong solutions to harden tissue for microscopic work, as it will kill and harden microscopic animalculæ very readily. If a drop of it is put into water, or any material containing those small, living organisms, they immediately give a few convulsive kicks and die. And the attempt was made by physicians, as it is such a strong preservative, to put it in morphine solutions—morphine quickly deteriorates after it is dissolved—to preserve those solutions and use them, for example, for eardrops, dropping in the ear in case of ear-ache, and so on. But it was found that it killed the skin and the skin dried up and peeled off, and it could not be used, even in dilute solutions, in the ear, as a preservative, and the physicians who had lauded it immediately retracted their laudations, and there is hardly any use for it now. In strong solutions it will kill the skin and cause it to peel off—delicate skin. There are several brands on the market here.

The CHAIRMAN. Let me ask Professor Wiley—

Question (addressed to Professor Wiley). Is this what you referred to, Dr. Wiley, as "Milk Sweet?"

Chief Chemist WILEY. Yes; that was sold as milk sweet throughout different parts of the country, also.

The WITNESS. We met with three of those here. One is a milk sweet; another is freezine, put out by the firm of John B. Heller & Co. This is called "Special M Preservative."

Chief Chemist WILEY. I see "milk sweet" marked on the bottle there. "Milk cream sweet," there; it is marked there.

The WITNESS. Oh, yes; "milk and cream sweet." Yes. Before that it says, "The only scientific invention for keeping milk and cream sweet." But there is a preparation known as milk sweet under that label, I believe, put out; I think it is in Elgin.

Chief Chemist WILEY. Yes; it has been sent to me for analysis several times from Illinois.

The WITNESS. I think Elgin is the headquarters. And here is another one put up in Chicago by the Preservaline Manufacturing Company. This is sold by the Creamery Package Manufacturing Company, and is known as "Special M Preservaline." It is the same thing, formic aldehyde.

Senator HARRIS. I see that first preparation is highly commended for use in cream puffs and in ice cream, and therefore probably utilized by the confectioners and people of that class, as well as in milk.

Answer. Yes, sir; it is. I have not actual knowledge. I never analyzed any cream puffs that had it in, but we find it in milk, used in milk, and the parties have been prosecuted for using it.

Senator HARRIS. I notice it requires an increased quantity, etc., in cream puffs and in ice cream, so that its use would be probably more dangerous in those articles than in milk?

Answer. The cream puffs are of course beaten up. The cream is beaten up fluffy and stirred with the air, you might say, and the air included, so that they readily sour and break down.

Senator HARRIS. That is to prevent fermentation.

The CHAIRMAN. What is the second sample that you show there; preservative?

Answer. It is the same material under a different label. The same material, put out by a different firm, but under a different label.

The CHAIRMAN. What is it called?

Answer. Special M Preservaline. "M" is supposed to mean, I presume, milk, or what is sold for milk.

The CHAIRMAN. Have you any evidence, or have you been told by people in your neighborhood, as to its common use, as to whether it is used commonly or not?

Answer. We have seized packages of it in milk houses, the houses of certain dairymen in Milwaukee; and we have found it in milk, in one instance, and prosecuted the party successfully, and it has been pushed very strongly in our city by circulars and otherwise.

The CHAIRMAN. It has been advertised?

Answer. By circulars, yes, sir; and by handbills.

The CHAIRMAN. Could you send one to the committee, if you should happen to have it?

Answer. I don't think I have any of them now; but I might be able to find one.

Senator HARRIS. Have you ever looked into its use, in the direction that I indicated a while ago, by confectioners?

Answer. No, sir; I never have.

The CHAIRMAN. Have you any other samples of antiseptics that are used in food?

Answer. Yes, sir; I have a few. Some antiseptics are also used for other purposes; that is, they are used for improving the apparent quality. They do not actually improve the quality, but they cover up the poor quality.

The CHAIRMAN. They improve the appearance?

Answer. There is a meat preservative [indicating same] called "New Method Meat Preserver;" "Highly recommended for preserving and protecting fresh meat, pork, liver, sausage, pudding, bologna, summer sausage, hamburger steaks, and chopped meats." The prices are given. He uses 2 ounces with every 100 pounds of meat. That is sold in Milwaukee.

The CHAIRMAN. Where is it made?

Answer. I don't know where the chemicals are made. It is boxed and sold in Milwaukee.

The CHAIRMAN. Have you analyzed it?

Answer. Yes, sir.

The CHAIRMAN. What does it contain?

Answer. It is sulphite of sodium.

The CHAIRMAN. Is that, in your opinion, a dangerous food product?

Answer. Well, it is an undesirable one. It is like alum and most of those chemicals. They have no part in pure foods.

The CHAIRMAN. Did you make a personal analysis of this?

Answer. I examined them personally, all of these that I have submitted here. Here is one that I have not examined completely [producing same], but I brought it down simply because it has aniline coloring matters to make a sausage look bright red as well as to act as a preservative. It is a mixture of salt and niter, coloring matter, and I think some other substance.

The CHAIRMAN. What is that called?

Answer. This is called "Rosaline." It is put out by the same firm that puts out the freezine; and I have other of their artistic preparations [producing another preparation]. There is what Heller & Co. sell. This is their sample bottle, and is called "Freezen." It is for chopped beef, etc., and it compares with this [referring to "New Method Meat Preserver"]. It is sulphite of sodium, with a little coloring matter in it.

The CHAIRMAN. You consider that also an objectionable thing to go into food products?

Answer. I do.

The CHAIRMAN. Before you pass this "Rosaline," I will ask you have you made any analysis of this?

Answer. No, sir; I have only examined it superficially. It is salt, largely, and coloring matter of an aniline nature and niter and borax, or boracic acid. Here is a preservative that is largely pushed [producing same]. It is called "cream albuminoid."

The CHAIRMAN. When you say "largely pushed," you mean extensively advertised?

Answer. I mean advertised, and that agents are up there trying to place it among the dairymen.

The CHAIRMAN. What is the name of that?

Answer. Cream albuminoid.

The CHAIRMAN. Where is it made?

Answer. I have not any knowledge as to where it is made. It is sold by the Creamery Package Company, of Chicago.

The CHAIRMAN. Is the address given there?

Answer. The address is given on one of these others. It is not given on that one.

A BYSTANDER. The address is 5 Washington street.

The WITNESS. I think most of these supply houses supply similar goods, but I don't say that definitely of this company especially. There is a demand for them.

The CHAIRMAN. Have you analyzed that preserver?

Answer. Yes, sir. It is what they have sold under the name of Preservaline. It is boracic acid or borax, mixed with gelatin powder. The object of the gelatin is to give a thick creamy consistency to milk, which is preserved with this, or to thin cream.

The CHAIRMAN. That you say is objectionable, the same as all the other antiseptics?

Answer. Yes, sir; it is objectionable, both as an antiseptic and as a fraud. That is a combination.

The CHAIRMAN. It is doubly objectionable, then?

Answer. Yes, sir.

The CHAIRMAN. It comes under both heads of the resolution—that is, a fraud upon the consumer, and at the same time it is deleterious to public health?

Answer. Yes, sir.

The CHAIRMAN. What is it you have in your hand there, Professor?

Answer. This is a sample bottle of coloring matter, which is sent out to color cream and skimmed milk to make it look like a milk rich with cream.

The CHAIRMAN. What is that made of?

Answer. That is made of sulphated aniline, yellow.

The CHAIRMAN. What do you say as to the propriety of the use of that?

Answer. Why, the object of its use is deception. I think it is ruled out of the first class that we mentioned, and this is largely deceptive. It is one of the coloring matters that is not exceedingly injurious, but it is an aniline coloring matter.

The CHAIRMAN. When you say "an aniline coloring matter," I was laboring under the impression that aniline meant red.

Answer. No, sir; it means made of aniline oil, a chemical obtained from coal tar, and they take many hues. There are many hundreds of different compounds, and many of them are —. Aniline first came into importance through the production of a red coloring matter, which took the place of a very valuable red coloring matter of nature.

The CHAIRMAN. What is that called?

Answer. Magentan was that coloring matter; so that aniline came into importance as a coloring product for its redness, but now the colors have taken almost ever hue.

The CHAIRMAN. Then when you speak of aniline dyes it may mean any color?

Answer. It may mean any color which is derived from coal-tar products, having aniline as a basis.

The CHAIRMAN. Have you any other samples?

Answer. I have no others in this connection.

The CHAIRMAN. Any antiseptics?

Answer. Here is one which is sold, a preservative compound, for use in canning fruit. [Witness here produces same.] Parties have sold this preservative compound for this use, and I don't know that they advocate its use in private families, but they have stated in their circular that it is not a salicylic-acid process. They have not stated what the compound is, but the circular states that it is not the salicylic-acid process. The material is salicylic acid, salicilate of soda, and phosphate of soda—a mixture of those three.

The CHAIRMAN. What is it called?

Answer. They sell not the material, but the process, and they call it the "American woman's standard canning process," and they sell the process and give the material, with their method of working; and they frequently sell the process to parties owning large orchards, in order to preserve their fruit, and they frequently will pay a large sum of money for the use of the process, and they will put up their goods, unknowingly, with salicylic acid, without boiling them, and they can use less sugar in the preserves, and in that way they innocently injure the public.

The CHAIRMAN. The ingredients themselves, you say, are not necessarily deleterious to health?

Answer. The ingredients are; but they sell it without telling what the ingredients are to the party who buys the process, and the party who buys the process uses these chemicals not knowing their actual composition.

Senator HARRIS. He thinks the gun is not loaded?

Answer. That is a fair summary of it.

The CHAIRMAN. That is another process for getting deleterious food into the stomachs of people that we have not had before this committee—by selling a process, and getting people to innocently use the process, which really contains injurious substances?

Answer. Yes, sir.

Senator HARRIS. They are accessories before the fact.

The WITNESS. They rented a booth at the State fair, and hired a lady to show canned goods preserved with this material, and then ladies going by taste and look at the fruit, and it is very bright and the color is good. It has not been boiled. The color is bright, and the goods look nice, and they find ready sales for it, and their counters are generally crowded.

The CHAIRMAN. They simply give the prescription?

Answer. No; they give them this, already put up. They do not tell them what the substance is. They give them these packages, of which that is a small sample [referring to sample previously produced], and they make them write to them and get more, if they want more.

The CHAIRMAN. Have you any other preservatives?

Answer. Nothing that is not along the same lines.

The CHAIRMAN. There are certain food and drink products that actually require a limited amount of preservatives, are there not, outside of sugar?

Answer. There are certain food products that are perishable. The old-fashioned notion was that we needed to use those food products while they were in season and fresh. For example, that in the fall cider was made from apples, and it was used then, and there were apples for it then, and it was used while it was fresh and sweet, until it got hard. When it got sour, they let it go into vinegar, and sold the pure cider vinegar. Now it seems that cider merchants think it necessary to keep cider in its apparently new state by the use of preservatives, and I think they are objectionable.

The CHAIRMAN. I suppose one objection would be, Professor, that they are put into the hands of and for the use of ignorant people, who do not know how little or how much they may use with safety.

Answer. That is one objection, and another is that they are getting so that they enter into every class of foods, while you take a little in the cider, a little in the milk, and a little in the canned goods, in the aggregate you get considerable quantities; and they have got to be stopped somewhere, and I think the place to stop them is to keep them out.

The CHAIRMAN. And it is used in beer, is it not, Doctor?

Answer. It is especially used in beer, I think, for bottling purposes and exporting: I don't think it is used to much extent in lager beer that is manufactured by good brewers.

The CHAIRMAN. You mean honest brewers?

Answer. Brewers that have good methods. They don't need to use it in their lager beer. It is quickly consumed, and the beer will not break down before it is used; but in bottled beers, where it is shipped long distances, and the temperature rises very much, unless they are very carefully treated—the easier way out of it is for the brewers to preserve it. That is a simple statement of it.

The CHAIRMAN. Have you had any occasion to analyze any of the bottled beers that contain antisepsics?

Answer. Yes, sir; I have. I found it in some of the bottled beers. A recess was here taken until 2.30 o'clock.

2:45 P. M.

The committee met pursuant to recess, whereupon Prof. A. S. Mitchell resumed the stand and further testified as follows:

Examination continued by the CHAIRMAN:

The CHAIRMAN. Professor, have you any other matter to present to the committee touching the adulteration of foods which to your opinion are deleterious to the public health which now occurs to you?

Answer. There are none that occur to me which affect public health. That statement does not apply to drugs, but to foods.

(The members of the committee consulted together with Chief Chemist Wiley as to whether the committee should enter in its investigation into the matter of the adulteration of drugs, whereupon:)

The CHAIRMAN. Very well, Professor, if you have any suggestion as to deleterious products that might strictly be called drugs and yet might, because of the manner of their preparation, enter into foods, you may give us such suggestions.

Answer. Cream of tartar was mentioned by Dr. Wiley. There is one thing which I have examined to some extent. As a rule, the cream of tartars which were purchased by the inspectors in Wisconsin of the drug stores was of usually high grade and generally had a large amount of actual cream of tartar in it. The samples which were purchased of the grocers, as a rule, were not cream of tartar to any great extent. Eighty per cent of those from the grocers were substitutes for cream of tartar. They were substitutes that were generally composed of acid phosphates of lime and alum mixed with starch, and sometimes small amounts of cream of tartar were in them. In a few samples cream of tartar was impure, with possibly natural impurities in large amounts—tartrate of lime and sulphate of lime. Small amounts of the two latter impurities were more or less present in some of the samples from the drug stores, but the drug-store sample were of much higher grade and much more nearly worth the value paid for them.

The CHAIRMAN. These adulterated cream of tartars which you have described you consider deleterious, do you?

Answer. Well, that is the same question that we had concerning the alum baking powders. I don't think alum is suitable for food nor for food products. They are substitutes for the genuine cream of tartar and they are sold generally as phosphatic cream of tartars. The jobber buying of the manufacturer buys them as phosphatic tartrates, but he sells them to the grocer as cream of tartar. They did, at least, until we investigated them up there some.

The CHAIRMAN. Pure cream of tartar itself you do not consider deleterious?

Answer. Cream of tartar is a chemical. Any drug itself, if given in amounts large enough, will cause physiological effects. I would prefer cream of tartar to an alum substitute by all odds.

The CHAIRMAN. What other substitute is used for cream of tartar besides alum?

Answer. Acid phosphate of lime.

Q. How is that made? What is it made from?—A. As an actual fact, I don't know the exact process of the making. It is made either from bone phosphate or from the natural rock phosphate, and it is made by treatment with sulphuric acid—mixing a little with the sulphate of lime in a measure, and the acid phosphate of lime is set free, and that solution is evaporated with a small amount of the sulphate of

lime in it, forming this moist or nearly dry acid phosphate, and that is mixed generally with flour to stop its caking. They generally mix it with starch.

The CHAIRMAN. Now, take this matter of the starch that is used in mixing these adulterants, and used in mixing baking powders; is there any difference in that starch, or is it usually one kind?

Answer. It is usually cornstarch.

The CHAIRMAN. Do you know a substance which is sometimes called flourine, which is a by-product of glucose?

Answer. I know of it, but I don't know much about it. I know it has been used as an adulterant for white starches occasionally.

The CHAIRMAN. You have never had occasion to analyze its food qualities, have you?

Answer. I have a sample and had examined it, but I had not made an ultimate analysis.

The CHAIRMAN. Then you would not wish to give an opinion as to its healthfulness?

Answer. I don't think I am competent; no, sir.

The CHAIRMAN. We have another class of adulterants covered by the direction of the resolution, known as mere commercial deceits, that are not deleterious to health. I would like to have you state, for the benefit of the committee, some of those that are most prominent, in your opinion, and the remedy which you would advise for them.

Answer. There are foods which are in themselves food, like flour or buckwheat middlings, which are frequently mixed with foods of an entirely different class, as condiments, and sold. Those foods, in my opinion, should be entirely prohibited when mixed with food of another class. They are simply adulterants, just used for the purpose of reducing the strength and for cheapening the whole of the product. They add nothing to the value of it, and are nothing more than a simple diluent.

The CHAIRMAN. Your opinion would be that you should prohibit the use of, for instance, cocoanut shells in pepper?

Answer. Yes, sir; I would go further than that. The cocoanut shells are not in themselves a food; they are used simply to adulterate—to increase the bulk in weight of the compound; but I would go further than that and say that pepper should not be adulterated—white pepper, for instance, with buckwheat middlings, even though the latter is a food.

The CHAIRMAN. Buckwheat middlings is one of the common adulterants of pepper?

Answer. For the white pepper; yes.

The CHAIRMAN. It is not deleterious to health?

Answer. Not at all.

The CHAIRMAN. If it was marked for what it was, what objection would there be to selling it?

Answer. Just this, that there are two classes of compounds. One you can mark with a formula, and they do some good in permitting their sale. To go to another branch of foods, for an illustration: You can compound certain sirups, and certain flours, like buckwheat and corn and wheat flour, and make a pancake flour and put the formula on it, and each one of these flours is suitable for a pancake flour, and it adds to the value of the compound, and makes a mixture of a certain consistency and desirability; and the purchaser, the consumer, may want that mixture and desire it. The same with breakfast foods. That sort of a compound is a legitimate compound; but if you should add to the pepper, if you should add anything the sole purpose of

which was to dilute it to make it look like pepper and increase its bulk and weight so that the consumer thinks it is pepper, the consumer gets nothing whatever for the flour or the adulterant, whatever it is, even though the adulterant is a food which is in there, for his money. The consumer gets less pepper in either case than if he had bought the full pepper at the full price and diluted it himself. It is only the middleman and the jobber who get the benefit of diluting with these substances which belong to other classes of foods.

There are other compounds that are permissible, perhaps—like flavors which give flavors like vanilla—and cheaper beans, like the tonka beans, can be used with vanillin and made into a solution which will give a desirable flavor, a cheap flavor, a substitute for vanilla, that can be used in many compounds. The flavor is not as fine and nice as the genuine, by any means, but it is a cheap substitute which perfectly takes its place, just the same as glucose in sirups, for instance, in common sirups, takes the place of cane sugar. It is in itself a good substitute, just as oleomargarine takes the place of butter in its place as a substitute, but it should not be sold as the genuine. Those compounds, I think, if they can be controlled, are permissible, but compounds which are simply pepper adulterated with flour, or cocoanut shells, or cinnamon refuse, or ground ginger, or, as in one case I knew of, with ground junk or tarred rope ground into it to give it the stringiness necessary. Those compounds are not permissible, even if they are labeled as adulterated.

The CHAIRMAN. What was this case where you say the rope was ground in?

Answer. Ginger is a root and the fiber of it is peculiarly stringy, and if you adulterate it with anything which runs readily over it, flows readily, it does not give the stringy consistency of the ginger; and in one case the ingenious adulterator used old tarred rope, junk. That is unusual. That is not, of course, customary.

The CHAIRMAN. I should judge from your statements that you are familiar with the use of glucose in the place of cane sugar. I am trying to get the distinction that you make, but perhaps I am unfortunate. Would you permit glucose to be mixed with cane sugar or with cane syrup and sold for what it is?

Answer. With the formula printed; yes, sir; that is a legitimate compound in my opinion.

The CHAIRMAN. But you would not permit pepper to be diluted with buckwheat bran, as you call it, even where it is marked.

Answer. No, sir. Where the foods are of the same class; where one is a proper substitute for the other; where it could be used, in fact, where the other is not used at all, and takes its place as a food, such compounds, in my opinion, are permissible; but where the adulterant is simply something to dilute, like water in milk, for instance, or like the flour in the pepper, why those compounds are not permissible compounds.

Senator HARRIS. Your remarks would apply especially to the adulteration of coffee, then, with chicory—that is, if it were properly labeled?

Answer. I think that would be a permissible compound if it were properly labeled, because chicory will make a drink, and while it does not produce the chemical or physiological effects of coffee, and while it is not coffee, yet it is a desirable drink, however, and liked by several persons.

Senator HARRIS. How would it be in the case of mustard, which is mixed with flour, turmeric, I believe, quite frequently?

Answer. I think that flour is an objectionable diluent.

Senator HARRIS. It destroys the beneficial effect?

Answer. It only weakens it; its only object in there is to weaken it. If the mustard were pure and had no flour in it, then you would be in the same position in adding the turmeric as you are with the butter in adding butter color, perhaps; and it is a question if the coloring was not deleterious and did not conceal some inferiority; it is a question whether you would not be pretty arbitrary in ruling out the coloring matter.

The CHAIRMAN. The coloring matter in butter adds to the beauty of the butter, but it also deceives, does it not, the consumer somewhat in this, that in supposing that the butter he eats gets its coloring naturally he is misled?

Answer. In that way every color added to a food helps to deceive the customer.

Senator HARRIS. Helps to sell an inferior article?

Answer. Not necessarily. It helps to sell the article. It is a question in my mind if, supposing we had yellow butter, made at this season of the year from grass, and that butter was held until the fall, the butter would change, it would not be as bright, and would not be as fresh, and would tend to break down; but it would have this natural, nice yellow color. Now, had you rather eat butter which is made, say, along during next winter; hadn't you rather eat butter that was made at that time, and is fresh and bright, and not rancid, and colored up so that it does not look like grass, provided it is not colored in imitation of anything else, or had you rather go back and eat storage butter which was made last June?

Senator HARRIS. I would like to have the option and privilege of deciding which I would take.

The WITNESS. Well, I think that is right. That is one question which I have been unable to decide for myself, whether those colors should be ruled out or not. I have not fully decided in my mind which would be better.

The CHAIRMAN. But you are clearly of the opinion that it ought to be ruled out of all articles, like oleomargarine, that are used as substitutes?

Answer. Where it covers up imitations in any food article, it ought to be ruled out, and beyond question where it conceals inferiority in the food article it ought to be ruled out. If you are going to go further than that, maybe, as a matter of policy, it might be better to rule them out entirely; but the actual damage does not seem to be great in their use.

Senator HARRIS. I would like you to say something about what your experience has shown you in regard to the adulterations of coffee. Have you found any really deleterious adulterants of coffee, or are the adulterants more for the purpose of swindling in bulk and weight, and all that kind of thing?

Answer. I think the latter. I don't know as I can add much to what has been testified in that respect. A few years ago coffee was high in price, quite high in price, and there were farms started in north of Milwaukee there, raising chicory in large amounts; and fraudulent beans were manufactured all over the country, and they sold, roughly, at 9 cents a pound, the fraudulent coffee beans. They looked like coffee beans when they were roasted; they had the little crease in the center of the berry, and those were on the market a few

years ago. Of late I have not met with them, but I have met with considerable coffee that is coated or glazed. The claim of the coffee man is that glazing fills the pores and keeps in the aroma, the flavor of the coffee. That is their side of it. Our side of it is that it makes in weight and covers up imperfections. They take the black beans that they can buy very cheaply and they put on coloring matter at the same time they put on the glaze, which is some kind of dextrine. They put in a coloring matter like hematite, which is simply a mineral iron-ore paint, and that is fastened to the beans by the dextrine, so that it coats them and makes them a nice coffee brown or red brown in roasting.

Senator HARRIS. Hematite would naturally add considerable weight, would it not?

Answer. They don't add much in the process, but it tends to add to the weight considerably.

The CHAIRMAN. As it goes through this process it will take up a good deal of this shiny stuff?

Answer. Yes; it takes up the dextrine and the shiny hematite with it, and it all tends to increase the weight and to make the coffee look uniform and bright and full and rich.

The CHAIRMAN. Did you hear the evidence of Mr. Stewart here yesterday, when he showed us coffee here?

Answer. No, sir; I did not.

The CHAIRMAN. He called attention to some that he prepared himself for the market.

Answer. Was it glazed?

The CHAIRMAN. It was glazed. And he also called attention to the fact that there was quite a percentage put in it of these dead beans; that is to say, of these chicory beans, and he explained to the committee that it was what is known as black-jack, which was shipped from Germany.

The WITNESS. I have heard that name.

The CHAIRMAN. And he testified that they were absolutely worthless and worse than worthless?

The WITNESS. They are much cheaper than the artificial beans. I don't think they sell for over between 3 and 4 cents.

The CHAIRMAN. I think he said less than that, 2 or 3 cents a pound; it is known as black-jack. We propose, if we can, to have in the bill to prohibit the shipping of that into this country or the shipping into this country of any other article that is made in any other countries that can not be sold there. We wish to stop its coming here. What about ground coffee?

The WITNESS. Pardon me. Did the gentleman think it desirable to prohibit glazing entirely or not?

The CHAIRMAN. Yes.

The WITNESS. That is our wish, but we have not succeeded in doing it up in our State so far.

The CHAIRMAN. He testified that in his own State—he showed us coffee which he had glazed himself; and he said it added nothing to its value, I believe, but that he was obliged to do it to compete with his competitors.

The WITNESS. That is so with most of the spice manufacturers, I think.

Senator HARRIS. There was an idea suggested yesterday that was an interesting one, and one of value, and that owing to your connection with the National Board of Health—I believe you have some connection with that?

The WITNESS. I simply do their chemical work in the State of Wisconsin, locally.

Senator HARRIS. That was the desirability and the practicability of either our national board or the State boards establishing standards of purity for all of these spices. Say for red pepper and mustard, and allspice and cloves, and cinnamon and coffee, all should contain certain percentages of the essential elements of those articles. Has that ever been considered?

Answer. Our State law establishes such standards as are found in the Pharmacopœia; that is the book compiled by physicians and druggists for the preparation of drugs and medicines, and I would like to add right here that it is necessary, if you follow a book which is edited ever so often, that it is well to specify the latest current edition thereof, because the formulators and revisers of this Pharmacopœia find the new adulterations and the tests for them, and they alter their directions for these tests and standards; and so, to take advantage of their latest knowledge, it is well in such a bill, if you are going to follow the opinion or the standards laid down in the Pharmacopœia, to specify in the law the latest current edition thereof. Otherwise, when there are two or three Pharmacopœias out, one man may sell a thing at one strength, as required by one Pharmacopœia, and another by a newer one, which is just out.

Senator HARRIS. No matter how the standard may be taken, whether taken from such a work as the Pharmacopœia, or whether established by boards, do you believe that a State board and State legislation could possibly cover the ground?

Answer. They certainly could not unless they go by the standards laid down by the Pharmacopœia. That is compiled by a very large body of men.

Senator HARRIS. What I am getting at, is the police power of the State sufficient in that case? Can the State protect itself by establishing a law of that kind, saying that everybody should only sell goods that would reach a certain standard, and prescribing the standard; or do you think it would require national legislation?

Answer. I think national legislation is very desirable, but the way we have done in Wisconsin is not to hold things stiffly up to the standard laid down in the Pharmacopœia, but to take a flagrant case of adulteration, where the substance is far below the standard in the Pharmacopœia, and bring the Pharmacopœia in as quoted by our State law, as competent evidence of what a good and standard product should be; and there the courts have never failed to support us.

Senator HARRIS. In other words, you have not established a State standard specifically?

Answer. The standard is established specifically by the State law, that it shall be in certain quality and purity and conforming with the tests of the United States Pharmacopœia. That is our State law; but in its enforcement we have used discretion, so much that if a thing was slightly below the standard we have not tried to prosecute parties who sold it; but if a thing is much below, then we have not gone by the standard, but we have simply used the standard to show what a good, pure, and satisfactory article was in our prosecutions, and there it has been very acceptable. I think the standard ought to be—

Senator HARRIS. Why not stand rigidly to the law and require that standard? This leniency in certain cases is always likely to be abused.

Answer. I have always felt that it was the spirit of the law that was to be carried out rather than the letter of the law, and we might work some hardships with the Wisconsin law if we should carry it out to the letter of the law.

Senator HARRIS. If substantially similar laws were adopted in every State to those which you have, do you think that would be enough to cover it without Federal legislation?

Answer. No, sir; I would like to see Federal legislation establishing standards.

Senator HARRIS. You see there is some difficulty about the practicability of utilizing Federal legislation to take the place of the police power of the States.

Answer. Even if it could not go so far as that, it could regulate the sale of these goods in the Territories and in the traffic between the States, and we could easily control the manufactures within our own State.

Senator HARRIS. The State certainly can control not only what is manufactured but what is offered for sale within its limits.

Answer. We can, I know; but we only do it through rather a hardship on the retailer. The retailer buys these goods of the representatives of men outside of the State and their agents, and he buys them in good faith. Now, if we pounce upon him and prosecute him vigorously in all these cases—

Senator HARRIS. He would be taught to beware.

The WITNESS. We teach them to beware without any undue severity, if we can. We prosecute them when they won't quit. We warn them and tell them what they are doing, and ask them to quit, and we inspect again in a week, and if they do not quit then we prosecute them.

Senator HARRIS. I ask these questions because the matter of practicability has got to be considered, and we have to consider just to what extent State laws can go in protecting the people without calling upon Federal legislation. It is to a certain extent when Federal legislation steps in to regulate the domestic affairs of the State that it brings us up against some of the fundamental principles of the Government and makes trouble. There is difficulty in getting a law and enforcing it and sustaining it in the courts; and if it is possible for a State to protect itself by establishing standards of purity, perhaps, on the whole, it would be easier to reach the desired end that way than to have the Federal Government attempt it.

The WITNESS. The only objection to it is the objection that it comes to them from the departments enforcing those laws and from the wholesaler in the outside States; that the legislation in the various States is miscellaneous in a measure, and they do not quite correspond, and the manufacturers in sending goods into the various States have to be careful in their labeling and about sending wrong goods. I have in my satchel mustards that are labeled especially for Wisconsin, and also the mustard ordinarily sold, which would illustrate that. So the manufacturers would like uniform legislation, and I don't think that any of the State departments, except one or two, would object to it. It is desirable from our standpoint.

Senator HARRIS. State legislation has a decidedly beneficial effect. There is no doubt about that, not only from what you said, but we had a gentleman here this morning who said that the publication of the proportions of glucose and pure maple sugar, which was used

in sirup, had tended, in Ohio, I think was the State he mentioned, to increase the sale of pure sirups and diminish the sales of inferior grades mixed with glucose.

The WITNESS. That is so with flavoring extracts in Wisconsin. The manufacturers of purer and stronger flavoring extracts are wholly in favor with us, and they say that sales have increased thribble.

Senator HARRIS. It helps the better article?

Answer. Yes, sir; it has in many cases.

Senator HARRIS. What drugs, as far as investigation goes, are most adulterated? You may name a few of the most common drugs.

Answer. Most of our work has been officially on foods. Our law has been in effect up there only a little over a year, and we have had a great deal of work on foods, and we have not really done work on drugs at all thoroughly as yet. The most of the drugs so far which we have met with that were adulterated were simply not properly purified; not purified simply to conform to the medicinal strength laid down.

Senator HARRIS. Not sufficient in strength?

Answer. To the medicinal strength as laid down by the pharmacopœia, which is the standard for our drugs; it was a little higher than that found in many of the drugs. Such drugs as are commodities are the ones most adulterated; for instance, such as so-called household ammonia, compounds that are called cherry phosphate, root beer, and things of that sort; they are hardly drugs, but are commonly on sale and prepared by druggists.

Senator HARRIS. Do you think that the establishment of a national board of health with power to prescribe standards would be of value?

Answer. I think it would in a degree, but I think that the standards ought to be in a measure fixed by the law. I think they ought to be considered by Congress rather than a board.

Senator HARRIS. What I mean is, of course, that the national board of health would, by the collection of proper evidence, arrive at the standards, and that then they would become the lawful standards, the legal standards, that would give it the force of law.

The WITNESS. I would rather see the standards established by Congress, by an act of Congress.

Senator HARRIS. Congress would have to act through some such body as the board of health. There would be constant changes.

The WITNESS. The standards for most of those things are laid down in the pharmacopeias, which are standard works and authorities on them, and all of these manufacturers manufacture their goods of the purities, or at least label them as of the purity, and manufacture them in accordance with the tests and strengths laid down by the pharmacopœia.

Senator HARRIS. That is, there are already standards established which could be taken?

Answer. There are standards adopted which should be adopted in the law, in my opinion.

Senator HARRIS. If the law went no further than merely to require that the ingredients or the formula should be given, that it should be a matter of giving notice to the buyer just what he is buying, without an attempt to prohibit, how far do you think that would benefit the public?

Answer. I tried to fix that. I don't think that a certain class of goods should be permitted to be sold, even with a formula. The reason is quite clear. If a man sells a pail of adulterated pepper, and

on a label on the side of the pail he marks it in small letters "adulterated pepper" at the bottom of the pail—that is taken into a grocery store and put under a counter or on a counter, for that matter, with the label toward the grocer. A woman comes in and asks for pepper, and no woman ever asked, to my knowledge, for adulterated pepper that she intended to use herself. The grocer, without comment or remark at all upon the package which he sells her, dishes out this pepper, and in that way he sells his whole pail of pepper. There are other compounds, like the compound syrup, that the woman would take, knowing it was a compound. So she might take oleomargarine, or a lard substitute, knowing what it was, but there is a certain class of goods that nobody would use, for they are not used as compounds, and those, I think, ought to be prohibited entirely.

The CHAIRMAN. Have you in the course of your examinations had any occasion to analyze different samples of lard?

Answer. I have examined some, but I have not made any positive examination of those on the market.

The CHAIRMAN. Do you know whether lard is adulterated or not?

Answer. I do.

The CHAIRMAN. What with?

Answer. It is adulterated with certain grades of cotton-seed oil, that make the lard of softer consistency than it would ordinarily be, and the consistency would be brought back by the addition of beef stearin. Exceptionally, paraffin wax has been used to bring back this consistency.

The CHAIRMAN. How is that made?

Answer. It is a petroleum product, made from coal oil.

The CHAIRMAN. Is it, in your opinion, a good food product?

Answer. It is not a food. It is perfectly indigestible and is not a food. A lard compound containing that should, in my opinion, be prohibited. That does not belong to the food class.

The CHAIRMAN. Take the other products, beef stearin, and cotton-seed oil. Those you do not consider deleterious to health?

Answer. Not necessarily, no, sir; I should think they might be permitted. Their sale might be permitted under proper labels.

The CHAIRMAN. Why would not the same objection apply to a pail or a large cask of lard which would apply to the pepper, when people come in and ask for lard, or do they buy it all in original packages?

Answer. I think then that the labeling should be the same on the smaller packages in each case; but the same objection would not apply with quite as much force, because the adulterant in the pepper is an inert substance that does not take the place of the pepper itself, but these other oils do take the place in the food and in the cooking, provided they are not paraffin or something of that sort that the lard does.

The CHAIRMAN. But beef stearin will produce the thickness that is taken away by the introduction of cotton-seed oil.

Answer. That is its object largely.

The CHAIRMAN. If you put in enough of it?

Answer. Yes, sir.

The CHAIRMAN. But you can put in less paraffin wax?

Answer. Very much less.

The CHAIRMAN. And produce the same stiffening quality?

Answer. Yes, sir.

The CHAIRMAN. Do you have any State law on that subject?

Answer. Our State law would be sufficient to cover it, I think. The paraffin wax would be considered a deleterious subject, and I think we could obtain conviction upon it. We never have.

The CHAIRMAN. What would you suggest as to national legislation on that subject?

Answer. I think legislation requiring branding on the smaller packages—the packages that would ultimately be delivered to the consumer—would be sufficient perhaps.

Senator HARRIS. Do you think so with oleomargarine?

Answer. I think so; yes, sir.

The CHAIRMAN. Do you know what butter oil is?

Answer. Butter oil? You don't mean oleo oil?

The CHAIRMAN. No; I mean an oil that is sometimes sold, called a butter oil.

Answer. I am not certain that I recognize it under that name.

The CHAIRMAN. Did you ever know of its being used in the manufacture of butterine?

Answer. I think it is what I call oleo oil.

The CHAIRMAN. What is oleo oil?

Answer. It is extracted from beef stearin, the more fluid portion of beef stearin, that is used in the manufacture of oleomargarine, mixed with neutral lard, or sometimes the addition of cotton-seed oil, to make butter imitations.

The CHAIRMAN. Butterine sells wholesale and retail at different prices, does it not?

Answer. Yes, sir.

The CHAIRMAN. What makes some of it cheaper than others and some dearer than others? Is it a mere arbitrary fixing of the price, or is there some real reason for it, in your opinion?

Answer. I think there is some considerable reason for the price. It is somewhat arbitrary, of course.

The CHAIRMAN. Some years ago it was quoted at 2 cents a pound?

Answer. Some years ago we used to get butterine with considerable actual butter in it. Now we get very small percentages in it, indeed. And of course butterine that had butter in it would cost considerably more, and the butterine which is made largely of cheaper oils sells for a lower price.

Senator HARRIS. Did the creameries of your State ever use in their butter, as an adulterant, oleomargarine or any of its products in any form? I have heard that creameries did buy from the packing houses oleomargarine and these various oils and work it in with their butter.

The WITNESS. I think there were two instances. I have investigated several of them, but I never found anybody who did, but I know through hearsay of two instances. Of course that is in violation of the internal-revenue laws, and the penalty is very severe for that, and it is not done to any extent.

Senator HARRIS. I asked if it had ever been done because I supposed from what I had heard that the practice had been more or less stamped out.

The WITNESS. I think it has, but I think I know of two cases that would come in that class.

Senator HARRIS. Your State legislation has assisted in that direction by supplementing the national legislation?

Answer. Yes, sir; we have worked hand in hand as much as we could. We assist them and they us.

The CHAIRMAN. I did not quite understand. In what way can oleomargarine be made cheaper? You say the cheaper oils. Are there any other oils besides cotton-seed oil that can be put in?

Answer. Cocoanut oil has been suggested. I don't know that it is

in use in any butterine manufactured on the market to-day. Cocoanut oil is used for a lard substitute.

The CHAIRMAN. Cocoanut oil; that is the oil of the meat of the cocoanut?

Answer. Of the cocoanut; yes, sir.

The CHAIRMAN. And if properly handled—

Answer. It is a clean vegetable oil.

The CHAIRMAN. This oleo oil or butter oil, if that is the same, then, is a product of beef stearin?

Answer. Yes, sir; of beef fat, with the more solid portions removed, crystallized, and pressed out.

The CHAIRMAN. Have you any suggestions, Professor, as to the law in regard to oleomargarine? I believe I asked you that this morning, though.

Answer. The only one I can think of is that a national anticoloring law would aid in its enforcement; would aid the consumer in knowing when he gets it.

The CHAIRMAN. Have you ever heard of any adulterations of tallow?

Answer. By the use of the fat of dead animals, etc.? You mean tallow for soap making and similar purposes?

The CHAIRMAN. No; take tallow for crude purposes. It is used somewhat for crude purposes, is it not?

Answer. It may be, but not to my knowledge.

The CHAIRMAN. Isn't it really tallow that goes into oleomargarine?

Answer. It is this oleo oil and butter oil that come from it, but I had never heard of that being adulterated in itself; but I have never examined into it to see. The commercial grades of tallow that are used as grease on the market of course have unclean fats in them sometimes—that is, they are not cleanly in their manufacture.

The CHAIRMAN. Is there any way now to distinguish, in manufacturing tallow, so that when you buy it for any use you can tell whether it is tallow from refuse, or dead animals picked up on the street, or whether it is tallow from a healthy animal?

Answer. I know of none except by its general odor and general appearance. The oils that are used in the better grade of food products are carefully kept from becoming tainted or rancid. The price of the product is lessened rapidly if any tainted oils are used.

The CHAIRMAN. Do you think of any other substance now that is adulterated that is a mere fraud?

Answer. Flavoring extracts, possibly.

Q. Just tell us about that, please.—A. May I get a few samples which I have in the other room?

The CHAIRMAN. Yes.

(The witness produced same.)

The CHAIRMAN. Now, we will take these samples one at a time. What is an extract that you are talking about now?

Answer. Well, an extract is sort of a trade name at present for the various flavors which represent and in many cases are obtained from fruits and substances, with the names pertaining to them. The extract may be largely alcoholic.

The CHAIRMAN. What are they usually made and sold for—for what purpose?

Answer. These extracts are sold for flavoring foods, and in some cases medicinal purposes. The lemon extract is made in accordance with the formula given in the *Pharmacopœia* for spirits of lemon; that is the more technical name than "extract." It should contain at

least 5 per cent of the pure oil of lemon peel, and that should be dissolved in deodorized stronger alcohol and colored with lemon peel the color of lemon peel. The Pharmacopœia, in its last revision, in the attempt to get the scale as near to a decimal scale for all products as possible, changed the formula, which required 1 ounce of oil in a pound of extract, which made it 6.13 per cent of oil, I think—changed the formula to 5 per cent of oil, attempting to get back to decimal 10 better, attempting to get them all on a regular basis of 5 and 10 per cent, etc. So the last Pharmacopœia requires 5 per cent of oil. The druggist manufacturers, according to the Pharmacopœia, and the older druggists, many of them, manufacture a stronger extract, and the higher priced extracts on the market contain larger amounts of oil of lemon, up to 8 per cent of the oil dissolved in alcohol.

When the Wisconsin law took effect the lemon extracts which were on the market had so little oil in them, many of them, that if they were put into water they did not even cloud it. Oil and water do not mix readily. They have just a little of the aroma of the lemon, and they were highly colored with aniline colors; generally aniline yellow, tropocelin, and dy-nytral-creosol are the compounds which were commonly used, and which I have often found, which make this bright yellow color which is given to this article. Stronger alcohol was not used in these extracts. Most of the expense of making a lemon extract is the expense of the alcohol, with the tax that is on it, with only 5 per cent of oil in a bottle of extract; and the oil itself costing only about 60 cents a pound, the actual oil in value is only a fractional cent if there is 5 per cent of oil; so the expense in making the extract is in the alcohol. If they use weak alcohol—that is, alcohol with water—the water will not dissolve the oil. The alcohol strength ran down from 93 and 94 per cent, which it should be of alcohol, down to as low as 13 and 12 per cent in exceptional cases, and then, of course, if they used oil of lemon, the lemon flavor would be so weak that the extract would not be readily salable, so they use something which has a lemonlike flavor, even in small amounts, and that is ribbon grass, a lemon grass which is much like our garden ribbon grass, but grown in the East India Islands, from which an oil is extracted which has a rank lemon flavor; and a trace of that oil—less than one-tenth of 1 per cent—will flavor these extracts so they taste a little lemony and smell considerably so. They don't taste so much so, but they smell quite like lemon extract.

The CHAIRMAN. Is that sample you have there supposed to be lemon extract?

Answer. I have several samples here. Some are lemon extracts—

The CHAIRMAN. Well, just take the lemon extracts first, so as to have some system about it. Have you made a chemical analysis of those?

Answer. I have one certain brand here. I will show you several samples of this same make which I have examined, and show you the variation which the State law has caused in extracts up there. You see how thin that bottle is [indicating], and that is made with stronger alcohol and has over 5 per cent of oil of lemon in it, and is not highly colored, you notice. That complies with the Wisconsin law. To sell it at the price at which they have been selling these cheap extracts they have cut down the size of the bottle to that size. When the law first took effect, this same manufacturer hoped that we would only be critical in regard to the purity of lemon extracts and not as to their strength. So he made a pure lemon extract, uncolored. He thought we were going to entirely prohibit the coloring of lemon extracts,

whether they were colored to conceal inferiority or not; and if we were not going to consider strength, there was one that was pure, weak alcohol and pure oil of lemon, and that was the extract put upon the market by that firm at this time. We wrote to him, and he changed his formula and now sells in Wisconsin this one [exhibiting another bottle of extract], which complies with the law in strength as well as purity.

The CHAIRMAN. It is simply whittled in size?

Answer. It is simply whittled in size, but still, if it was whittled in size—I can not tell you just the amount of oil in this one, but there is much less than 1 per cent of oil. If this [indicating] contains 5 per cent of oil, the bottle could be one-fifth that size and still have as much actual flavor in it as the other has. The chief extracts on the market had less than one-tenth of 1 per cent of oil of lemon, when they should have over 5—that is, one-fiftieth of the actual flavoring which they should have. They obtain this of weakly alcohol, with the oil of lemon—pure, nice oil of lemon—by adding this ribbon grass and by adding citral obtained from ribbon grass, which has less rankness. Citral is also obtained from oil of lemon. There [referring to bottle] is one of the compounds which was sold, marked “compound extract of oil of lemon and citral,” with lemon peel for “lemon flavor.” They don’t call this lemon extract, but they say it is for lemon flavor. It happens there is no real good substitute for lemon extract except oil of lemon, as that is because we have not permitted the sale of compounds as substitutes for lemon extracts in Wisconsin. Most of the extracts have the aroma, but lack in strength. They will not flavor materials made from them as they should.

The CHAIRMAN. How about vanilla extracts?

Answer. Before I leave lemons, here is an extract [producing a bottle] that had 7 or 8 per cent of oil, and it was on the market, made with stronger alcohol, and there [indicating] is a sample of a good commercial extract. It had nearly 8 per cent of oil, and there are many others; that is not an exceptional one. The vanilla extracts—

The CHAIRMAN. How should it be made?

Answer. The Pharmacopœia requires that it should be made with 10 per cent of vanilla beans, and alcohol and water; no coloring matter. That would make quite an expensive extract, and a very strong, fine one. Vanilla extracts are very hard things to control, either chemically or commercially. There are many substitutes for the vanillas which in themselves are good flavoring substitutes, but much cheaper, much inferior, and perhaps somewhat injurious.

The CHAIRMAN. What are the substitutes used for the vanilla bean?

Answer. The natural flavor in the vanilla bean is somewhat due, largely due, to a crystalline substance called vanillin. This substance can be made artificially; this same crystalline substance can be made artificially from other substances. It was made first from a layer between the bark of the willow and the wood, and is made from similar sappy layers in other coniferous trees. Finally processes were found for making it from oil of cloves. Oil of cloves contains a chemical substance called eugenol. This eugenol can be readily converted by chemical methods into this substance which is produced in the vanilla bean by its ripening. Vanilla beans themselves have other substances that lend aroma and lend body—ole-resins that lend body to the extract—besides this one active principle, but this is the active principle of the vanilla bean, just the same as quinine is the active principle of Peruvian bark. But it does not mean, by any means,

that the whole of the good of the vanilla is embodied in that one chemical.

The CHAIRMAN. In other words, the vanilla bean has other qualities which add to the real value of vanilla as an extract, which you can not get outside of the vanilla bean?

Answer. Which you can not get outside of the vanilla bean, or outside of that one crystalline substance. Still, that is a valuable flavoring substance in itself, vanillin is. They can not have as much of this oil of lemon grass, and these other substitutes in the lemons so well.

Then there is used as a substitute in vanilla flavoring the tonka bean, a much cheaper bean, a little bean which you may remember seeing the older folks use in their snuffboxes, a little brown bean, about as long as the joint of your finger, and it has a grayish-white powder, and it is very aromatic, and the old ladies used it to flavor and scent their snuff. That tonka bean gives a strong flavoring substance that is used as a substitute for vanillin. Then the flavor of this tonka bean is due largely to its active principle, cumarin. The cumarin is also made chemically, artificially, from coal-tar products, and that cumarin will impart a flavor to solutions similar to the tonka bean. Cumarin causes dizziness and headache, and it has some marked physiological poisonous effects when used in quantities; it is more objectionable than vanillin.

The CHAIRMAN. It is used in some cases as a substitute for vanilla?

Answer. It is commonly used. Almost all the cheaper grades of vanilla extracts that you find in the stores to-day contain cumarin, either natural cumarin from the tonka beans or cumarin artificially made.

The CHAIRMAN. That, you consider, is a fraud upon the consumer, and at the same time a deleterious substance?

Answer. It is a fraud, and it is a question if it is not a deleterious substance that should be prohibited—the cumarin. I have here a sample of vanilla and tonka compound extract, or, rather vanilla and tonka compound, which was sold on the market in Milwaukee as extract of vanilla, for flavoring ice cream, cakes, jellies, custards, etc. When this law took effect, the manufacturer of this compound sent his men into Wisconsin and told them, in order to comply with this law, to re-mark these bottles which were marked "Extract of vanilla"—to strike their pens through the word "Extract" and write above vanilla the word "For," and to print on top of the label the words "Vanilla tonka compound," making it read "For vanilla for flavoring." There was no claim that it was vanilla; but before this law went into effect they used the original label, and also alterations.

The CHAIRMAN. Did you analyze any of this?

Answer. I did not analyze that. The tonka nut smells—I can tell by the smell it is tonka extract; that much of it.

The CHAIRMAN. Before the law it read "Extract of vanilla," "for flavoring ice creams, jellies, cakes, custards, etc." After the law it is branded "Vanilla and tonka compound. For vanilla. For flavoring."

Answer. Yes, sir; it is sold as a substitute for vanilla.

The CHAIRMAN. But the ordinary man who simply saw that word "vanilla" there—and if I asked for vanilla extract, and was not critical in examining, I would get this, would I not?

Answer. Yes, sir. Almost all of those are colored. They are colored sometimes with brown sugar. Here is another one that was

manufactured similarly, and labeled in accordance with the Wisconsin law. [Exhibiting same.]

The CHAIRMAN. This is now under the present law of Wisconsin?
Answer. Yes, sir.

The CHAIRMAN. It reads, "Holland Imperial. Full measure, compound extract from vanilla," etc.

Answer. That is another of our State rulings. It is necessary in the enforcement of these laws, if we find anything which is working injury, to change our rulings, and we always reserve the privilege, after due notice, to change our rulings, if any undue advantage is being taken of them.

The CHAIRMAN. Is this vanilla?

Answer. That has not been analyzed. It was brought for the label's sake only.

The CHAIRMAN. It says, "Compound extract of vanilla and cumarin."

Answer. Yes, sir. The coloring of these substances—these extracts have been colored largely with brown sugar, but after we became able to readily detect the caramel color in the extracts they had to get a coloring matter which would be harder for the detection of the chemists. They got an extract which was like the coloring from the beans, and then they began to color with prune juice, which is a little harder for us to detect. That is a dry substance, somewhat similar in character to the vanilla beans, but there is a chemical difference in the ole-resins, and that can be stopped, probably.

The CHAIRMAN. I understand you to say, Professor, that in this matter of extracts both branches of this investigation are covered. Some adulterated, simply fraudulent, and some of them are adulterated in a way so that they are not only fraudulent but deleterious to public health?

Answer. Yes, sir; possibly deleterious.

The CHAIRMAN. This cumarin will produce dizziness?

Answer. It will in large amounts. Still, the question will then come up whether in the use as a flavoring there is enough of this cumarin to produce any dizziness, and if that will not pass off. You will get into a physiological argument then.

The CHAIRMAN. What would you recommend, after your study upon this subject, as to a national law? What provision can be made to regulate the sale of these extracts, so that the consumer will know pretty much what he is getting?

Answer. I think that standards should be fixed not only for purity but for strength, through solutions of substances the strength of which can be readily determined, to a large degree. The law should regulate the strength as well as the purity.

The CHAIRMAN. Have you ever considered the proposition made by a witness the other day who said that instead of stamping our adulterated foods the Government should have a system whereby an honest manufacturer could procure a Government stamp?

Answer. I have to consider that very frequently. The honest manufacturers, who are enthusiastic and energetic, think it is a strange thing if the State government can not guarantee and authorize the use of its name upon the pure-food products of the State. We think it is not desirable. We think food products generally should be pure, and that any manufacturer who was producing food products should make them pure, and if he adulterates them, then it is time for the law to step in. We don't think there is any more occasion for that than there would be to investigate men that were not under suspicion.

Senator HARRIS. You think that the adulterated food should be the exception, and not the pure food?

Answer. I do. I think the law ought to step in and attend to that, regulate their sale rather than the sale of pure products. It is not the object, as I understand these laws, to permit, in any way, any department of the Government to be used for the commercial advantage of any one or more firms, and as soon as we would do that we would be going out of our province, which is simply to protect the public.

The CHAIRMAN. There is a double purpose, I think, in the law, Professor, isn't there? To give an honest manufacturer an even show in the transaction of his business, and not permit a man who is deceiving the public to have any unfair commercial advantage?

Answer. That is surely so, but it comes about in a secondary way. That is right, as we first—

The CHAIRMAN. That is one of the effects, and not the real reason of the law?

Answer. Yes, sir.

Senator HARRIS. The direct object of the law should be to punish or prohibit the dishonest manufacturer?

Answer. That is the way I look at it.

Senator HARRIS. But incidentally the honest manufacturer is benefited?

Answer. That is as I look at it.

Senator HARRIS. Do you think of any other food product which you would like to speak about this afternoon?

Answer. I do not. We have been pretty well over the ground of most of these products—jellies, and similar substances. There has been one case in Milwaukee where they have sold an acid which was deleterious to health, undoubtedly, in the manufacture of jelly from the apple cores and parings.

Senator HARRIS. Before we leave the extract question, I want to ask you the question whether or not these artificial food products are largely used in your State?

Answer. Why, there are large numbers or varieties of them on the market, but there is very little demand for them. They stay on the shelves for years, according to our inspectors' stories.

Senator HARRIS. Have you ever had occasion to examine these fruit sirups used at soda fountains?

Answer. Yes, sir; that is a different matter.

Senator HARRIS. How are they made?

Answer. Well, they are made with a mixture of various chemical ethers, and those are mixed with sirup, producing these flavors. They are colored generally. They are artificial. They are not made from the fruit except in a few instances.

Senator HARRIS. Does your State law control that, Professor?

Answer. It does if they are injurious, but we have ruled a little peculiarly on it, perhaps. We have tried always to rule liberally, and close in when we have found it necessary. We have ruled that where a fruit flavor could be made from the substance itself, as from the lemon, the oil of lemon, or where it could be made directly from the substance, as vanilla, we would not permit the artificial. But where artificial flavors only were to be obtained—for instance, like strawberry, banana, or pineapple—where there can not be commercially an extract made from those substances which will produce the characteristic flavor or aroma of it, there we have permitted the sale

of the artificial, but we have not permitted the sale of the artificial where the genuine can be obtained or made.

Senator HARRIS. Can raspberry juice be used in a soda fountain?

Answer. Pure raspberry juice can be used.

Senator HARRIS. Do you permit raspberry flavor to be sold?

Answer. We permit raspberry artificial flavor to be sold as an extract or flavor. Another thing, we have not gone into the soda-water work nor candy work as we perhaps should and will later. We have taken up first the necessities of life, the foods, and we have not worked into the luxuries, or the liquors, or the outlying branches. We are doing fundamental work and have at present our hands full.

Senator HARRIS. Is there any way to get the extract from the banana?

Answer. No, sir; not to my knowledge.

Senator HARRIS. What is this that is sold for banana flavor?

Answer. Well, it is a mixture of acetic ether, I think, and similar ethers. I don't know the exact composition of it, and I think the formula varies with various manufacturers, but acetic ether is the basis of it, and butyric ether; that and acetic ether and amyl-acetate, possibly.

Senator HARRIS. You were saying that there was a case where they had used acids in jellies that in your opinion were deleterious to health?

Answer. Yes, sir; there was one maker that used small amounts of sulphuric acid, which remains in his finished jelly, and we stopped him, and he was willing to stop and change his methods. He was a Milwaukee manufacturer.

STATEMENT OF GEORGE W. SMITH.

GEORGE W. SMITH, being duly sworn, testified as follows:

Examination by the CHAIRMAN:

Q. State your name, please.—A. George W. Smith.

The CHAIRMAN. Your residence?

Answer. Jefferson Park, Chicago.

The CHAIRMAN. You are in the flour business?

Answer. Yes, sir.

The CHAIRMAN. How long have you been in the flour business, Mr. Smith?

Answer. Twenty-nine years.

The CHAIRMAN. Are you familiar with the mixing of flours such as have been sold here?

Answer. Somewhat; yes, sir.

The CHAIRMAN. What is the common mixture taken for pancake flours, for instance? When you were dealing, did you deal alone in just wheat flour?

Answer. No; all kinds, everything.

The CHAIRMAN. One of the things I want to ask you about is the manner—I suppose you are aware of the fact that there has been a pure-food bill passed that prohibits the sale of anything for wheat flour that is not wheat flour. You know that fact, I presume?

Answer. Certainly.

The CHAIRMAN. Do you know the operation of the law, as to whether it has been beneficial or not?

Answer. Yes, sir.

The CHAIRMAN. I want to ask you about the mixing of pancake flours?

Answer. Well, they are all mixed.

The CHAIRMAN. Can you, as a rule, or can a customer, as a rule, buy buckwheat flour?

Answer. How?

The CHAIRMAN. Could I, as a customer, go down to a store and ask, for instance, for 40 pounds of buckwheat flour? What do I get for buckwheat flour?

Answer. If you ask for pure buckwheat, you can get it.

The CHAIRMAN. How is it mixed? With what is it mixed?

Answer. Why, it is mixed with a low grade of spring-wheat flour.

The CHAIRMAN. About what percentage is buckwheat?

Answer. For instance, when buckwheat comes in here as it will in October—that is the season—it will be worth \$6 a barrel.

The CHAIRMAN. Before it is ground?

Answer. No; ground.

The CHAIRMAN. Ground buckwheat flour?

Answer. Ground buckwheat flour. Then the dealer, the man that buys it, the wholesaler, he will buy a flour that is worth about \$1.75, and he will use two barrels of that \$1.75 flour to one barrel of buckwheat.

The CHAIRMAN. Is it still marked buckwheat flour?

Answer. It is still marked buckwheat flour.

The CHAIRMAN. In the use of buckwheat, have you ever had occasion to sell what is known as buckwheat shorts, or bran?

Answer. Lots of it.

The CHAIRMAN. For what purpose is that used?

Answer. It is used by spice mills and some of these large manufacturers. They grind it and mix it with their pepper. Buckwheat bran is used for black pepper and not white pepper, because buckwheat bran is black. The professor stated that it was used for white, but it is not used for white.

The CHAIRMAN. I suppose the buckwheat hull—

Answer. The buckwheat hull is black; but they use any kind of wheat bran, either winter or summer, for white pepper.

The CHAIRMAN. The question has been raised as to the adulteration of sugar. You are not a chemist?

Answer. No; I am not a chemist.

The CHAIRMAN. You have been in this flour and grocery business all these years; do you know anything, from hearsay or by reputation, as to the adulteration of sugar?

Answer. I do.

The CHAIRMAN. What is your information on that subject? Take pulverized sugar, for instance.

Answer. That is the only one I can speak about—what we call powdered sugar. From what I know of it, and have heard in the grocery business from retailers, and from my own personal knowledge by using, I never found any of it that was pure.

The CHAIRMAN. What is it adulterated with?

Answer. It is adulterated with cornstarch, because cornstarch is about the same color and they grind it just as fine.

The CHAIRMAN. They can mix it easily?

Answer. It mixes.

The witness was here withdrawn from the stand temporarily.

STATEMENT OF AUGUSTINE GALLAGHER.

AUGUSTINE GALLAGHER, being duly sworn, testified as follows:

Examination by the CHAIRMAN:

The CHAIRMAN. What is your name?

Answer. Augustine Gallagher.

The CHAIRMAN. What is your business?

Answer. I am in the publishing business.

The CHAIRMAN. Where is your residence?

Answer. St. Louis.

The CHAIRMAN. What paper do you publish?

Answer. The Modern Miller.

The CHAIRMAN. How long have you been the editor of that paper?

Answer. About seven years.

The CHAIRMAN. Did you take an interest in the bill known as the "pure-flour bill," which was passed by the Fifty-fifth Congress?

Answer. Yes, sir; I represented the millers in Washington.

The CHAIRMAN. And after that did you take a position under the Government?

Answer. Yes, sir; I was Government revenue agent; in charge of the enforcement of that act.

The CHAIRMAN. Are you now employed there?

Answer. No, sir. My resignation took effect on the 31st of March.

The CHAIRMAN. During the time that you were there, up to the time that you resigned, just state briefly to the committee the work that was done under what was known as the pure-food bill.

Answer. Well, we went pretty well over the whole field and the wholesale and retail flour field of the country seeking—

The CHAIRMAN. Before that time, state briefly what the adulterations were that were used.

Answer. The principal adulterant used was starch, cornstarch, made by the glucose mills; and there was another adulterant, known as corn flour, made by the corn mills—that is, a mill that would make meal, and grist, and various other products, a certain percentage of its product would be corn flour. It was used in some places, quite a number of places. Very frequently you would find a mill equipped to make corn and wheat flour, and they did a very nice business in the mixing of the two; but I think the latter years, before the enactment of June 13, the principal adulterant used was cornstarch, a product of the glucose mills. There was in a few instances a discovery of barytes.

The CHAIRMAN. That is a sort of stone, isn't it?

Answer. Yes, sir; that is a chalky substance found down in Georgia and Tennessee.

The CHAIRMAN. And mineraline?

Answer. That is a substance of the same character.

The CHAIRMAN. Ground clay?

Answer. Yes, sir. That was not used much. That was nipped almost in the infancy of its introduction. In investigating this matter, preparatory to bringing it to the attention of Congress, I discovered down in Georgia that the product had actually been moved from point to point as a commodity, by freight; but it did not come into general use. I don't think it got out of a radius of a couple of hundred miles down in that territory where it was produced.

The CHAIRMAN. Since the time of the enactment, up to the time the recognition went into effect, you had charge of that department under the internal-revenue law?

Answer. Yes, sir.

The CHAIRMAN. What has been the effect of it, in your opinion—you are not now employed by the Government—what has been the effect of it, in your opinion, so far as stopping the adulteration of wheat flour is concerned?

Answer. It has stopped it.

The CHAIRMAN. Have there been any seizures of improperly mixed flour under the law?

Answer. Yes, sir; quite a large number; but they were all under what was known in the revenue service as section 49, which provided that mixed flour, not properly branded, tax paid, found on the premises of certain people described, was subject to compliance with the law or seizure.

The CHAIRMAN. What effect has it had on the exporting of flour to other countries?

Answer. Well, our trade has been running along this year at about 20 per cent increase; at times larger and at times a little smaller. I think we will export several million barrels more flour this year than we ever have in the history of the country.

The CHAIRMAN. Do you attribute that somewhat to the fact that the Government has taken hold of this matter?

Answer. Very largely.

The CHAIRMAN. Have you any suggestion to make as to applying a general national food law to cover other food products besides flour?

Answer. Yes, sir; I would, from what I have seen and my investigations and work in this field—I would be very much in favor of a law that would cover every food, condiment, drink, and drug that is offered for sale for human consumption. There is no reason why people should be permitted to be dishonest in matters of that sort. You asked Mr. Smith a while ago to describe what they made pancake flour out of. He got off, however, and I thought I would remind him of it, if you had some reason for knowing that. I don't want to take the question away from Mr. Smith, though.

The CHAIRMAN. Go ahead.

The WITNESS. A great many of the pancake flours now are made—the basis of them is cornstarch or corn flour.

The CHAIRMAN. Will you state the difference between cornstarch and corn flour?

Answer. Corn flour is made by a direct milling process—the dry process—and cornstarch is made by a process of milling which—you remember we went through that pretty well before your committee during the session of Congress. They use an acid treatment to separate the starch cells. That process, I believe, was pretty fully described by a representative of the Glucose Sugar Refining Company, of this city, and by other representatives to your committee and before the Ways and Means Committee, and it is set out in extenso in the report of the Ways and Means Committee. It is quite a long process, and not being a practical glucose miller I would not be as well able to describe it as some have done.

The CHAIRMAN. Now, when you say corn flour, that is really corn meal ground finer?

Answer. Yes, sir.

The CHAIRMAN. They grind it finer and call it flour?

Answer. Yes, sir; pulverize it.

The CHAIRMAN. And if it is white corn it makes white corn flour?

Answer. Yes, sir.

The CHAIRMAN. If it is yellow corn, it carries its color even after it is ground?

Answer. Yes, sir.

The CHAIRMAN. You have described that. What is this flourine?

Answer. That is gluten—that is, cornstarch.

The CHAIRMAN. Is that flourine after the gluten and the sugar has been extracted from it?

Answer. That is what I would not be sure about. I would rather refer you to the records which have been made on that than to undertake to state it, because I do not know the process exactly. My opinion is that they make the starch first, and then the other products are products of the starch.

The CHAIRMAN. In this starch that is used in this flour—cornstarch that is used as a basis for pancake flour—as a matter of fact, is the sugar and the gluten extracted?

The WITNESS. From the starch?

The CHAIRMAN. Yes.

Answer. That is the information given by the people who carry on that business; yes, sir.

The CHAIRMAN. You were going on, when I interrupted you, to describe pancake flours. I suppose there are different varieties of them?

Answer. Yes, sir. Some people put rice in them, but they all use soda and salt and tartaric acid for leavening purposes. They add to the wheat flour the cornstarch or the corn flour, and then add these leavening qualities, and that produces the pancake flour.

Mr. G. A. HIRES. Is there anything injurious about the pancake flour you have just described, do you think? Do you think there is anything injurious about it?

Answer. That is a question. In going into that matter pretty thoroughly before the Ways and Means Committee of Congress, there was considerable evidence introduced there to show that there was yet remaining in starch free sulphuric acid.

The CHAIRMAN. You are not a chemist, are you?

Answer. No, sir; I am not.

The CHAIRMAN. You don't know what tartaric acid is made from?

Answer. No, sir; I merely referred to the record as made by Dr. Koler and some of the others on the committee. I did not go into that at all.

STATEMENT OF C. Y. KNIGHT.

C. Y. KNIGHT, being duly sworn, testified as follows:

Examination by the CHAIRMAN:

Q. State your name, residence, and occupation.—A. My name is C. Y. Knight. I live in Chicago, and am the publisher of a dairy paper, and am secretary of both the National and Illinois Dairy Unions.

Q. What is your paper that you publish here?—A. It is the Chicago Dairy Produce paper.

Q. In your official capacity, as connected with the State and national boards, have you had occasion to investigate the question of the sale of oleomargarine?—A. I have done little else during the last four years but investigate it.

The CHAIRMAN. You have given that your attention specially?

Answer. Pretty nearly all my time during the last two years has been spent in that direction.

The CHAIRMAN. The committee would like to have you state whether you have any suggestions to that law. First, have you any amendment to suggest to the law as it is?

Answer. Well, that depends, of course, as to how far Congress can go in legislating in that way. We have given that subject a great deal of attention, and spent a good deal of money in looking up the constitutionality of different kinds of laws; have traced that class of legislation in Congress, and all constitutional points regarding it, clear back as far as we could get them.

The CHAIRMAN. In other words, one of the questions is how far you can go into the matter of police regulations?

The WITNESS. As to what the Government can do in the shape of police regulations. We are at present raising, and have nearly raised, a fund of \$10,000 for the purpose of organizing and getting things in shape to go before Congress to ask for an amendment to that law. I have got \$7,000 of it in the bank already, and it is coming in at the rate of \$100 a week, so we will be down there all right. We have come to the conclusion that the only thing that can be done is through the Internal-Revenue Department. We have gone back until we have struck decisions in the Supreme Court thirty years ago, where they have turned down a law made by Congress regulating the mixture of naphtha and petroleum as unconstitutional, because it was interfering with the police powers of the State, and we have struck all of those decisions. In fact, we have had what would be called in the Patent Office a validity search in the laws, in that respect, by different attorneys, and can enlighten you probably a little bit—

The CHAIRMAN. I am interested on that question, because it may save us a little time in looking up the law. Your counsel seem to be of the opinion, as I understand you, that the police regulation of this matter within the States is not within the constitutional power of Congress?

Answer. That was decided in a case some thirty years ago, I think, in Michigan, directly by the Supreme Court of the United States, and I have the decision, which I could show you in a few minutes.

The CHAIRMAN. The Supreme Court decided that where it was put formerly, even though formerly under the internal-revenue law, as in the case of oleomargarine, filled cheese, and, as now, in the case of pure flour, the Supreme Court has held, as I remember it, that it could be regulated when an attempt was made to raise the revenue for the Government.

The WITNESS. The Supreme Court took this view in that Michigan case. The case came up in Michigan. There was a tax on petroleum—I have forgotten how many years ago—and the internal-revenue law which put that tax on petroleum made certain regulations regarding the mixing of petroleum and naphtha. The excuse, I believe, which was given for the controlling of that mixture was for the protection of the gaugers. Congress repealed the tax on petroleum, but left the law standing regarding mixing. It was brought to the test in the Supreme Court, and the Supreme Court decided that inasmuch as the tax part had been repealed, that the other had no standing; that so long as it was a regulation for the protection of those engaged in the collection of the internal revenue in any way it was valid; but when the internal-revenue clause had been taken

away, that it was interfering with the police powers of the State and was the proper thing for the State to do.

The CHAIRMAN. But that the Government had a perfect right to tax any of these products, and if protection came as an incident to revenue it was all right?

The WITNESS. And in his message to Congress, in signing the oleomargarine bill thirteen years ago, the President went into that matter. He stated the fact that there were instances—I don't know that he cited them, but he stated that this was not the first instance where taxation was merely a vehicle for accomplishing other purposes when he signed that oleomargarine law.

The CHAIRMAN. As a matter of fact, the oleomargarine law and the flour law and the cheese law do not produce any more than barely enough revenue for the extra expense of collecting.

The WITNESS. Oh, yes, indeed; the oleomargarine law does.

The CHAIRMAN. I guess you are right about that.

The WITNESS. The others do not.

The CHAIRMAN. But even it did not, yet under that decision the law would stand, because it is in the line of cases suggested by the President, where the revenue law had simply been a vehicle to get relief where it could not be given in any other way.

The WITNESS. In the matter of taxation—

The CHAIRMAN. You believe that there should be some national pure-food legislation?

Answer. Oh, indeed, I think so. We have enacted by laws in thirty-three States what we call an anticolor law. In spite of the enactment of those laws in thirty-three out of the forty-five States in the Union, in the face of all of that State legislation, the production of oleomargarine in defiance of those laws has doubled in the last year. That is simply for the reason that the material or the article is of such a deceptive character that it is absolutely impossible after it leaves the hand of the manufacturer in that shape to keep track of it in any way. The internal-revenue law, or the law of 1883, has been a good check on that. At the same time it has even got away with the Government in that respect. It is only two months ago that in Philadelphia they made a raid among the retailers and found a hundred dealers selling oleomargarine without a license. There is an instance of where the Government is actually losing revenue through the lack of identity of that article. I will give you an instance of the way the law is observed in this State here. This morning I went out and went to a few stores and called for creamery butter. The packages that I got I have not opened. I brought them up here for you to open. Here is what I have. [Producing several packages.] If some disinterested party will open them up and show them to the committee, I will be obliged to him.

The CHAIRMAN. Dr. Wiley is the Government expert, and he is here.

(By direction of the chairman, Chief Chemist Wiley opened the packages referred to.)

The WITNESS (addressing Chief Chemist Wiley). Look the papers over carefully, Doctor; look the wrappers over carefully. The internal-revenue law requires that they shall be stamped, and the provision is very plain. That man [referring to the seller of one of the packages] has not stamped it. I know this is oleomargarine, because I saw it taken out of a box on which the stamp license was at the end.

Chief Chemist WILEY. This was sold for creamery butter?

The WITNESS. Yes, sir.

The CHAIRMAN. The package here is not marked.

The WITNESS. That has no mark upon it at all. Those oleomargarine packages are peculiar.

The CHAIRMAN. You say you saw it taken out?

Answer. Yes, sir; out of the oleomargarine box.

(The package referred to was marked on its wrapper "Exhibit 1, May 9, 1899, G. G. T.")

The CHAIRMAN. You saw this particular one taken out from the oleomargarine box?

Answer. Yes, sir.

The CHAIRMAN. Did you put any mark on it so that you could remember?

Answer. Yes, sir; I had it marked here [indicating a private mark of the witness on the package].

(The witness here presented a second package with the corner of the wrapper turned down and out of sight.)

The CHAIRMAN. As I understand, the law requires that each package be marked. The first package which you opened and which you state under oath you saw taken from an oleomargarine box upon examination shows that there is no stamp of any kind upon it.

The WITNESS. No stamp of any kind upon it.

(The second package last above referred to was marked "Exhibit 2 May 9, 1899, for identification, G. G. T.")

The CHAIRMAN. The one which we have marked "Exhibit 2, May 9, 1899," and which you say you received—

The WITNESS. I have marked the price on the outside: "Bought for creamery butter; paid 18 cts."

The CHAIRMAN. Paid 18 cents for it. Was that taken from the oleomargarine box?

Answer. Yes, sir.

The CHAIRMAN. That one shows a concealed mark, "Oleomargarine," but folded in such a way that it would never be detected unless search was made for it. Sample No. 3, which I ask the official stenographer to mark as Exhibit No. 3, what did you ask for in this case?

Answer. Creamery butter in every case.

(The sample referred to was marked by the official stenographer "Exhibit 3, May 9, 1899, for identification, G. G. T.")

The CHAIRMAN. Did you see this Exhibit No. 3?

Answer. Yes, sir; I saw every one of them.

The CHAIRMAN. Where was this taken from?

Answer. It was taken from the oleomargarine box.

The CHAIRMAN. I ask you to examine the paper and see if you can find the word "oleomargarine," as provided by law?

Answer. I find it back there, turned under.

The CHAIRMAN. It is marked oleomargarine, but concealed so that you would not naturally find it?

Answer. Yes, sir; there is a ruling on that subject given by Congress, by the Internal Revenue Department, regulating those things.

The CHAIRMAN. That is the third exhibit. [Addressing Dr. Wiley.] Dr. Wiley, will you undo the fourth exhibit?

(Dr. Wiley did so.)

The WITNESS. Those I took just as I came to them. I did not select the place, but just as I found the butter stores, and there are 1,700 of them in town, or in the northern district.

The CHAIRMAN. The half-pound oleomargarine law is what covers this?

Answer. Yes, sir.

The CHAIRMAN. It says: (The chairman here read the section of the oleomargarine law relating to half-pound packages.)

The CHAIRMAN. I now call attention to sample No. 4, on which the word "oleomargarine" is printed on the inside of the package. Did you ask for creamery butter in that case?

Answer. Yes, sir; in every instance I asked for creamery butter.

The CHAIRMAN. How much did you pay for it?

Answer. It is marked on the outside, I think. The wholesale price of butter at Elgin was 16 cents; I paid 18 and 20 cents for those articles. Eighteen cents is what I paid for them.

(The fourth exhibit was marked "For identification; Exhibit No. 4; May 9, 1899; G. G. Taylor".)

The CHAIRMAN. These packages you say you did not open until you brought them here?

Answer. No, sir; the last one I bought just as I came up here. I can send any gentleman to any store around and he may ask for butter and he will get the same thing.

Senator HARRIS. Mr. Knight, this exhibit has no relevancy to any proposed change in the law. It is merely an illustration of how the law is avoided and not complied with.

The WITNESS. Well, no, Senator. The statistics I have here I think will support the theory or idea which I would suggest, and that is that there is absolutely no way to compel the selling of oleomargarine as such so long as it is permitted to be colored in imitation of butter. Here is a map, Senator [presenting same and handing to Senator Harris], the shaded States of which are the States which have enacted those laws; and in spite of the enactment of all those laws prohibiting the coloring of oleomargarine to resemble butter, the production of oleomargarine and the output and sale of oleomargarine during the last year has doubled over that of the previous year, because of the fact that the sale was being pushed and the dealers are being protected by the manufacturers.

Senator HARRIS. You would admit that there would be a probability of increased production and sale of oleomargarine, even with the law fully carried out and on its own merits?

Answer. It is not sold on its own merits.

Senator HARRIS. I know; but even if that were the case you would admit there would be some increase in the production and sale of oleomargarine, wouldn't you?

Answer. It is sold in the States where it is illegal to sell it.

Senator HARRIS. But if colored to imitate butter?

Answer. But it is not sold any other way. There is no such thing as selling uncolored oleomargarine. Nobody ever saw it except in a few places where it has been experimented with, and the people would not consume it where they knew it was oleomargarine. There is no such thing as uncolored oleomargarine.

Senator HARRIS. Is there any such thing as uncolored butter?

The WITNESS. Why, in the flush of the season there is very little, if any, coloring matter used in butter.

Senator HARRIS. But take it in the winter time?

Answer. No, sir. I think that almost universally butter is colored in the winter time.

Senator HARRIS. What is the distinction in moral turpitude between the man who takes oleomargarine to sell it as butter and the man who colors bad butter and colors it to imitate and deceive the purchaser with the idea that he is getting good butter?

Answer. Well, bad butter and good butter have no distinction in color. You can not tell bad butter from good butter at all.

Senator HARRIS. There are certain seasons in the year when the butter is inferior in flavor and also in color?

Answer. You mean in the winter?

Senator HARRIS. In the winter.

Answer. People in the winter time do not go around looking for butter that has been produced in the summer in order to get a superior grade of butter. Consequently they are not deceived into thinking they are getting summer butter.

Senator HARRIS. It is colored to make it more attractive?

Answer. It is colored for uniformity. We would care nothing at all about the color of butter if we could have it the same the year round. If butter had the advantage that oleomargarine has by having a uniform color, the raw material, so that it would be of uniform color the year round, there would be no necessity and we would not care a cent whether it was white or what color it was.

Senator HARRIS. You think there is a prejudice against the white color?

Answer. Not at all, sir; if people are brought to the custom. In England they want butter as white as they can get it.

Senator HARRIS. When you talk about "if people are brought up to" such and such a thing, if people were brought up to use oleomargarine they would not object to it, I suppose?

Answer. If oleomargarine were to go on its merits for a few months, or a year or so, being white, it would get its legitimate use then. People would learn that it was and consume it as oleomargarine.

Senator HARRIS. My point simply is this: Ought it not to be prohibited in every case? It is a deception.

Answer. I do not think it is a deception at all in butter. I do not see where it is. It does not conceal the quality at all. Yellow butter is no better to the taste than white butter; not the slightest bit. There is no difference between them. It is as easy to digest as yellow. There is no difference in the quality of the butter on account of the color.

Senator HARRIS. It is done solely for the sake of uniformity?

Answer. Solely for the sake of uniformity.

Senator HARRIS. That is, a man will take the trouble to color his butter in the winter, because he produces yellow butter in the summer, and not because the customer prefers yellow butter?

Answer. Because a man the year round is eating butter, he does not want it white one time and yellow another. He does not want to buy butter one day that has come from some cow that has been fed with feed which makes the butter yellow and the next day get it white. He does not want white butter on his table one day and yellow the next. He wants uniformity. Fruit is packed with a view to uniformity. Oranges of a certain size are packed in boxes with others of that size. You could not sell the orange if there was a small orange here and a big one there. They want everything uniform. Our idea of life nowadays is uniformity. We want uniformity in architecture and in everything. If butter was white, we would not be making oleomargarine yellow.

Senator HARRIS. I thought the conformity in architecture was considered rather monotonous and disagreeable.

The WITNESS. We want symmetry or something of that kind.

Senator HARRIS. And it is purely for an æsthetic reason that we want butter colored?

Answer. It is a matter of business.

Senator HARRIS. A matter of business?

Answer. Yes, sir; business, from the standpoint of uniformity; that is all.

Senator HARRIS. Well, business; I think that covers it. It is a matter of increased profit?

Answer. No, sir; I do not think so; I do not think so. If we ship butter to England, it must be just as white as we possibly can get it.

Senator HARRIS. There may be a market in one case, and you govern the production of the stuff on the market, and you in this manner, where yellow butter is desired—you use artificial means to produce the yellow color?

Answer. We will use artificial means to produce a uniformity which deceives no one. Nobody thinks butter is better because it is yellow.

Senator HARRIS. Unquestionably, if the market generally—you say in England they demand it. It may be a mere fancy, but it has a practical value in the market?

Answer. It is of value only to customers.

Senator HARRIS. It does not make any difference how it arises, you respond to the demand?

Answer. We respond to the demand.

Senator HARRIS. By artificial coloring?

Answer. Yes, sir.

Senator HARRIS. As I say, I can not exactly see how you could draw the distinction you made in the one case from the other.

Answer. Maybe I can read you a little extract from a letter that will show you why we do. Here is one from William J. Moxley, the butter maker, manufacturer of butterine, Chicago. He says:

Inclosed find a color card, which is as near the color of our butterine as the printer's art can represent. Our aim in sending you this card is to aid you in selecting the proper colors suitable to your trade. Mistakes are easily made, but sometimes hard to remedy. In nearly every section of the country there is a difference in the color of butter, and even in certain seasons of the year there is a change, as you will have noticed. In winter butter is of a lighter color than in summer. In many sections this is the result of difference in feed or pasture.

We can give you just what you want at all seasons, if we know your requirements.

If butter is light in that section, they must buy light oleomargarine to make the people think they are getting butter. If butter is required to be yellow in that section, they will give him yellow oleomargarine. He sends that color card so they can tell what kind of oleomargarine they want, so that it can be sold as butter and people will think it is butter, because it is the practice in that country to have a certain kind of butter.

Senator HARRIS. In the production of natural butter you mentioned a while ago that the feed had quite an effect.

Answer. Yes, sir.

Senator HARRIS. One farmer or dairyman, by the use of certain kinds of feed, even in the winter time, can produce butter of a better color than a farmer who uses an inferior class of feed?

Answer. I would not say inferior—different.

Senator HARRIS. Well, different. I believe that slop-fed cattle or swill-fed cattle do not produce butter of a very good color, do they?

Answer. Well, I don't know what effect swill has on the color, I am sure.

Senator HARRIS. As a practical butter man, haven't you observed the differences in butter of a swill-fed cow and—

Answer. When it comes down, Senator Harris, to the question of different feeds on cattle, I can not go into that, because my experience is in the production of butter instead of milk.

Senator HARRIS. My experience is in the feeding. Now, a great deal has been said all through this discussion about the protection of the honest and skilled manufacturer of pure foods. You believe that he should be protected and should not be injured by an imitation proceeding from an inferior or a more careless manufacturer?

Answer. That is right, sir.

Senator HARRIS. Now, the skilled feeder of cows and the producer of butter can, even in the winter time, produce well-colored butter.

The WITNESS. But it is not better.

Senator HARRIS. That is not the point I am getting at. It is more attractive and sells at a better price.

The WITNESS. What difference does it make—go on.

Senator HARRIS. That is the proposition which the purchaser must answer. You know as a fact that it sells for a better price, do you not?

Answer. I do not; no, sir.

Senator HARRIS. You say there is a demand for yellow butter?

Answer. That is all right, sir.

Senator HARRIS. What responds to the demand gets a better price than that which does not respond to it, I suppose?

The WITNESS. There is a demand for white butter, and it costs 2 or 3 cents a pound to bleach it.

Senator HARRIS. Then you simply would not color it yellow if there was a demand for white butter?

Answer. No, sir.

Senator HARRIS. It would not be any better?

Answer. No; surely not.

Senator HARRIS. But you would respond to the demand, whatever it might be?

Answer. We would respond to the demand so long as it was not imitating something else.

Senator HARRIS. It is imitating the butter which is most desirable.

The WITNESS. I can not agree with you. I see a good many hundreds of thousands of dollars' worth of butter sold, and—

Senator HARRIS. I think there is something to be said in favor of the man who, by better feeding, by keeping a better quality of hay—I believe even different qualities of hay will effect the coloring.

The WITNESS. Carrots are better than hay.

Senator HARRIS. But I am taking the simplest form of feed. Of course, you can color it by the use of carrots. Why should not he say that he is entitled to protection against the man who makes butter the color of lard?

Answer. Some Jersey feeders—you are talking like a good many Jersey men do, who would exclude the color from butter, so that the Jersey butter could sell at a higher price. If I had not heard you say you were a raiser of shorthorns I should think you kept Jerseys.

Senator HARRIS. If there is anything that I don't want on my place it is a Jersey cow; but why should not the Jersey man claim the right to sell without infringement by anybody else, by an artificial process, the legitimate products of his cattle?

Answer. Because his butter is butter, and the foundation is oil.

Senator HARRIS. The foundation of oleomargarine is oil.

The WITNESS. It is a different kind of oil, while butter fat is the

same kind of oil, has the same digestive capacity, and has the same flavor, so far as that is concerned, and is mildest at the same temperature. Butter fat is butter fat, and it does not matter whether it comes from the Jerseys and is accompanied by the pigment that colors it yellow or whether it comes from an Alderney or some other kind of cow that gives white butter. It is butter fat just the same, and the coloring does not make any more difference to it than the color of an apple does, as to whether it is a white or red apple, in the eating.

Senator HARRIS. And it is only done for the sake of uniformity?

Answer. Only done for the sake of uniformity. You may say that uniformity is to please the eye.

Senator HARRIS. I think it has some practical reason underlying it. This large sum of money that you speak of having raised is to be directed toward changing the law with regard to this question—

Answer. Agitation of the question and letting the people know that we are going before Congress to endeavor to get the laws which we now have in the State, which have four-fifths, nearly five-sixths I might say, of the population, to get them—

Senator HARRIS. On the point of color?

Answer. Yes, sir; and that is the matter we are looking into now and concerning which we are searching the records, and, as I said before, making a validity search to determine which way we can go. We are mapping out the road.

Senator HARRIS. There has been considerable said about the artificial coloring of jellies and of flavoring extracts and other things. Those are generally condemned?

Answer. Yes, sir.

Senator HARRIS. The point of your efforts is practically to bring about the exclusive privilege on the part of dairymen to color their butter?

Answer. Senator Harris, we are not asking anything that the Supreme Court of the United States and the supreme court of every State has not told us that we have. That is a matter that has been passed upon by the Supreme Court of the United States twice in our favor, that it is a deception to color some other kind of compound to resemble—it is not a matter of importance in this case of how butter is colored yellow; it is a matter of distinction, just as much as a distinction is had in all laws in all States practically prohibiting you from wearing your wife's dress out on the street and passing as a woman. There is the distinction. We have a dress of our own that we have been known in a good many years, and it does not matter how that dress is made; that is our dress, and we are known in it.

Senator HARRIS. I am simply taking the point between the man who can make yellow butter in the winter time and the man that makes butter-colored lard in the winter time. As between those two your method of coloring injures the butter purchaser.

Answer. I will say this, that it may be possible, under the decisions of the Supreme Court, if the man who makes that yellow butter comes forward and is strong enough to get that kind of a law it will be sustained.

Senator HARRIS. If he is strong enough?

Answer. Yes, sir.

Senator HARRIS. It is a case of might makes right?

Answer. Pretty nearly, in a case of that kind; but inasmuch as he has not asked for that law, we are not going out of our way to give it to him.

Senator HARRIS. No; I don't think you are altogether philanthropic here.

The WITNESS. No; I don't think we are built on that plan altogether.

The CHAIRMAN. I understand your position to be that the coloring of oleomargarine assists oleomargarine in being sold for what it is not?

Answer. It makes it entirely.

The CHAIRMAN. And that the coloring of butter simply—is it sold as butter?

Answer. It is not sold for anything else than butter.

Senator HARRIS. You do know of white butter and yellow butter?

Answer. No, we don't; because we make it all yellow.

The CHAIRMAN. If you don't do it with the feed, you do it when you churn?

Senator HARRIS. It is done for an aesthetic purpose?

Answer. Entirely. Here is a letter from another manufacturer. (The witness here read circular letters from Braun & Fittz and William J. Moxley to different dealers, copies of which letters are hereto attached and marked, respectively, Exhibits 1 to 5; and also the shaded map referred to in the testimony of the witness, showing the States in the Union which have laws forbidding the sale and manufacture of oleomargarine colored to resemble butter, which map is marked "Exhibit 6" to the testimony of this witness.)

Senator HARRIS. Have you any circular there from the manufacturers of coloring matter which is used in butter?

Answer. No, sir; they do not have to have circulars.

Senator HARRIS. I have seen various advertisements of colorings to be used in pure butter, in which it was claimed that you would get a higher price and that it would make your butter look fresh and better.

The WITNESS. Some coloring matter will fade. During the time that it is put in—you will put it in at a certain color and when it is taken out or when it goes onto the market or is exposed to the light it will fade. There is a difference in colors. It is not a matter of getting a certain color, but of keeping it.

Senator HARRIS. Do you mean to say that it is desirable to have a good, fast color for butter?

Answer. Surely. It is desirable to have a uniform and steadfast color, a color that will keep its uniformity.

Adjourned until 10.30 a. m., May 10, 1899.

Letter from William J. Moxley, dated October 15, 1898, as follows:

EXHIBIT 1.

CHICAGO, October 15, 1898.

FANCY BUTTERINE.

We still maintain the high standard of quality which has given this house the reputation of manufacturing the finest goods in the market and which has secured for us the largest output in the United States.

See our prices:

Daisy	solid 8½ cents net
Fancy Dairy }	solid 10 cents net
Special Dairy }	solid 11 cents net
Red Clover	solid 12 cents net
Extra Dairy	solid 14 cents net
Fancy Creamery	solid 15 cents net
Extra Fancy Creamery	

One-half and 1-pound rolls and prints, 1 cent extra. Larger rolls and prints, also solid packed, in less than 25-pound tubs, one-half cent extra.

Try "Golden Sheaf," "Elgin," and "Clover Leaf" brands in plain wrappers: 1-pound prints, 11 cents; larger prints, $10\frac{1}{2}$ cents. Or "Crystal Gems" and "Daisy Sheaf" in plain wrappers: 1-pound prints, $9\frac{1}{2}$ cents; larger size prints, 9 cents per pound; packed in cases.

Pure leaf lard, $5\frac{1}{2}$ cents.

In tierces or large tubs.

In 20 or 30 pound tubs, $5\frac{1}{2}$ cents.

All goods f. o. b. Chicago.

Moxley creamery is the best.

W.M. J. MOXLEY.

EXHIBIT 2.

On the letter head of Brann & Fitts, dated March 17, 1899, is the following:

STATION F, CHICAGO, March 17, 1899.

DEAR SIR: This is the season when the quality of butter is the very poorest. There is a general complaint about "poor butter" in all the markets of the country—*poor country butter and poor creamery*. You don't hear complaints about "the only high grade" butterine. You do about cotton-seed oil goods. Now is your chance to build up a first-class trade by handling only first-class butterine. Eggs are selling at cost, but "the only high grade" will give you profit, so keep pushing its sale and *build up a reputation for good butter*.

We quote, net f. o. b. Chicago:

Fancy Dairy (always reliable)	per pound	12
Lakeside (never changing)	do	$12\frac{1}{2}$
Diamond (sparkling)	do	13
Peerless (without a peer)	do	$13\frac{1}{2}$
Eureka, extra fancy dairy	do	14
Good Luck, fancy creamery	do	15
Unexcelled, extra fancy creamery'	do	16

One-pound rolls or prints, 1 cent extra. Larger rolls or prints, also solid packed, in less than 25-pound tubs, one-half cent extra. We make any shape or style goods and pack in any way the trade desires.

Send us trial order for our "Holstein," "Klondike," "Union," or "Elgin," put up in one-pound prints (48 in case, or small cases 30 in case), with printed wrappers, 13 cents—in two and three pound prints, $12\frac{1}{2}$ cents; "Holstein," in five-pound boxes (12 in case), 13 cents.

Strictly Pure Leaf Lard, in tierces and large tubs, $5\frac{1}{2}$ cents: small tubs, 30 and 40 pounds, 5-6 cents; 50-pound tins, 2 in a case, 6 cents; 20-pound tins, 4 in a case, $6\frac{1}{2}$ cents; 10-pound tins, 6 in a case, $6\frac{1}{2}$ cents; 5-pound tins, 12 in a case, $6\frac{1}{2}$ cents; 3-pound tins, 20 in a case, $6\frac{1}{2}$ cents.

Soliciting your orders, we remain, yours truly,

BRAUN & FITTS.

Have you tried our creamery?

EXHIBIT 3.

On the letter head of William J. Moxley, the following:

CHICAGO, December 10, 1898.

Messrs. A. KENNARD & Co., City.

DEAR SIRS: We would again call your attention to the advantages that a grocery-man may derive from selling a good grade of butterine, such as can be obtained at this establishment.

The enclosed list will show you that our prices will place you in a position to suit the desires of your customers. We can furnish you a grade of goods from $8\frac{1}{2}$ cents per pound that will astonish you, while our medium priced, at 10 cents, has all the qualities suitable for a good table butter. You will hear no complaints if you furnish your customers with our "Special," of which we are the sole manufacturers. (See price list.)

If you desire to handle the best possible production, you will find it in our "Creamery," at 15 cents per pound. It is equal to the finest creamery butter, no matter what price you pay for it.

A live groceryman keeps every article of food that his customers are likely to require. In this age of keen competition the man who is short of any one of the staples is going to lose trade. People will go where they can be best served.

When a woman goes to buy groceries, there is one article of goods she must have, and that is butter. She may want sugar, coffee, and other articles, but she wants butter, and wants it at a price to suit her means. If you can not supply her, don't expect her to buy her coffees, teas, and other articles of you, and then go a block to another grocery to buy 4 or 5 pounds of "Moxley's Special." If she is a practical woman, she will go to the store where all her wants can be supplied. Some are deterred from going into the butterine business through having to pay for a license. This is a mistaken idea. Ninety-five per cent of the dealers who take out a license for one year take it ever after; *the other 5 per cent fail in business. Nothing can save them.*

You are not aware, perhaps, of the perfection of our goods. Let us make this proposition to you: Return the inclosed postal with an order for 10 pounds. Being manufacturers, we can not sell you less. You can not sell those goods without a license, but you can use them in your own household. We are desirous of letting you test our goods, feeling confident, after a trial, you will enter into the business, which will be to the advantage of yourself and your customers.

Yours, truly,

W. J. MOXLEY.

Dictated by W. G.

EXHIBIT 4.

Another letter on the letter head of William J. Moxley, as follows:

CHICAGO, October 22, 1898.

Messrs. A. H. BARBER & Co., City.

DEAR SIRS: As the consumption of butterine has grown to such an enormous extent in Chicago, and knowing that you are not handling it, I wish to interest you in the advantages you can gain by taking out a license and putting in a stock. The people who buy it say it is better than butter and that it is more pleasing to the taste and in appearance. These are the reasons it has grown to be such a valuable food product.

Our butterine is made from pure, clean, and wholesome articles of food, such as are used every day by some one in some way, and the idea that it is not a pure-food product and a perfectly legitimate and staple article of food has been changed by its own merits. Your profit will be double the amount made from the butter you are now handling, and *your butter trade will be more satisfied if you will sell them such butterine as you can buy from me.*

Now, as to the annoyance given the dealers last year by the butter trust. I took care of my customers, and, as you know, the decision given by the court was wholly in my favor and makes my product an open commodity to the public.

I would like to send my representative to see you with samples of different grades, and send you a trial order from sample you may select. Butterine is rapidly pushing to the front and will soon be recognized as a necessity by all dealers; more desirable than butter. It does not have the off flavors, colors, and tastes which are so common an objection to butter. "Moxley's" butterine is the best made, and it has grown permanently in favor with the best and largest butter users in the country.

Please mail postal for an interview; or I would be pleased to have you call at the factory and see me personally.

Respectfully,

W. J. MOXLEY.

Dictated by W. J. M.

EXHIBIT 5.

Another letter on the letter head of William J. Moxley, as follows:

CHICAGO, April 5, 1899.

NOTICE TO THE TRADE.

Inclosed find a color card, which is as near the color of our butterine as the printer's ink can represent. Our aim in sending you this card is to aid you in

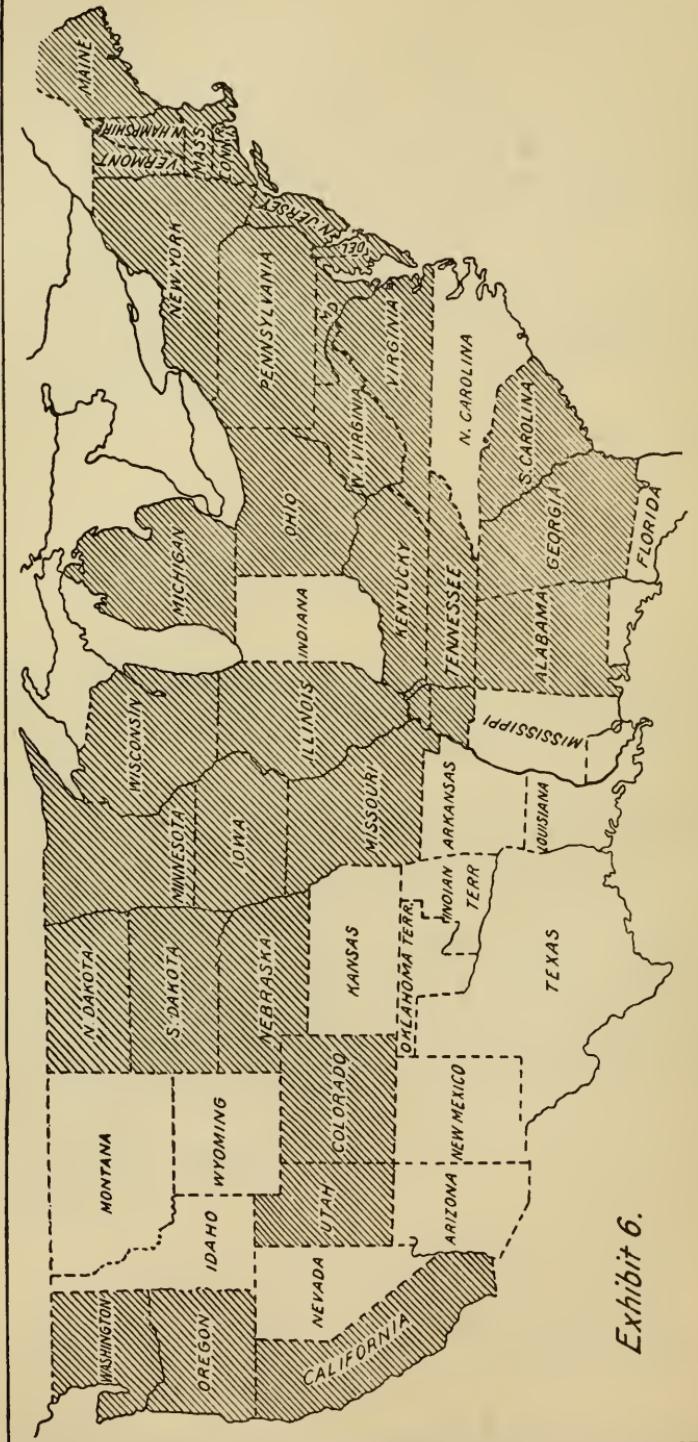


Exhibit 6.

The shaded States in the above map now have laws forbidding the manufacture and sale of oleomargarine colored to resemble butter.

selecting the proper color suitable to your trade. Mistakes are easily made, but sometimes hard to remedy.

In nearly every section of the country *there is a difference in the color of butter*, and even in certain seasons of the year there is a change, as you will have noticed. In winter butter is of a lighter color than in summer; in many sections this is the result of the difference in feed or pasture.

We can give you just what you want at all seasons, if we know your requirements. As an example, No. 1 has no coloring matter, No. 2 a little coloring, and so on to No. 8, which is the highest-colored goods we turn out. Preserve this card, order the color you want by number, and we will send you just what you want.

Yours, truly,

W. J. MOXLEY.

MAY 10, 1899—10.45 a. m.

The committee met pursuant to adjournment.

STATEMENT OF MR. ALBERT HELLER.

ALBERT HELLER, being first duly sworn, testified as follows:

Examination by the CHAIRMAN:

Q. Please state your name and residence.—A. My name is Albert Heller; residence, 1718 Indiana avenue.

Q. What is your business?—A. Manufacturer of stock foods, poultry foods, disinfectants, and manufacturer of a preparation called rosoline and one called freezine.

Q. Are you the proprietor of that establishment, Mr. Heller?—A. I am a partner.

Q. You are one of the partners. Is it a firm, then?—A. Yes, sir.

Q. Who are the rest of the firm?—A. B. Heller.

Q. I wish to state to you at the opening of the examination that this committee which has subpoenaed you is a committee known as the Committee on Manufactures of the United States Senate, and was directed to inquire into what food products are deleterious to health and what are frauds upon the community. I subpoenaed you for a double reason. Your preparations were brought here before the committee by the State chemist of Wisconsin, and in this examination I will say we have no desire to learn any of your trade secrets, if you have any; no disposition to injure your business if it is legitimate; and, the matter having been brought up, I thought I would get what information I could from you and at the same time give you an opportunity, if you desire to be heard, in regard to your own goods.—A. Yes, sir.

The CHAIRMAN. Now, we will take the first article that you prepare, which you have described as freezine.

Answer. There is one thing about our preparations that I would like to speak to the committee alone on, if I could, because, in order to explain everything, it is necessary for me to give away trade secrets.

The CHAIRMAN. I don't ask you to give away trade secrets.

Answer. Then I can not explain it as I would like to. I think I can convince you that these preparations are not alone harmless, but are healthful; but in order to do that it is necessary for me to tell you what is in them, and I don't like to do this before reporters and have it published, because there are others in the business and it will give away our trade secrets. I would be glad to tell you everything about them—any questions you may want to ask—the formulas and everything.

Q. I suppose almost any chemist can analyze them?—A. Certainly.

But these reporters will publish everything that I say, and the public will know all about these goods. It is really a trade secret—these formulas. Of course, the chemists can analyze them, but that would not give the public any other insight into our business; and if you will permit me to speak to the commission alone, I will tell you everything about it.

The CHAIRMAN. Do you understand that even if you were talking to the committee, outside of the presence of the reporters, your evidence would be taken down stenographically and would be a part of the evidence before the Senate?

Answer. I am willing that that be done, because it will not be published then as it would be if I give everything away here in the presence of the reporters, and if the reporters afterwards publish it from Washington I am willing that that be done. The entire report, I presume—that is, all the evidence—will not be published, will it? Simply your report. I am willing that that report be published, of what I say; but the entire evidence I give will not be published, will it?

The CHAIRMAN. It is the custom—I shall deal with you frankly, as I hope to with everyone—the custom is to take all the evidence; and the usual custom is to have it printed by the Senate. [Addressing Senator Harris.]

Senator HARRIS. It is taken down by the stenographer, and a literal transcript of what he takes down is printed as the report of the committee. The evidence which they receive is, of course, laid before the Senate, accompanied by the report.

The WITNESS. I was under the impression that only your report would be published.

Senator HARRIS. Oh, no. The custom is, in all investigations of this kind where a committee is appointed to take evidence, to have the whole transcript of the evidence accompany the report, so that other members of the Senate can draw their own conclusions from the statements made.

The WITNESS. Well, I would much prefer to give my testimony here in the presence of the commission alone, and then if it is published, all right, and if the newspapers want to get it from the report, I presume they can, but they can't get it then as soon as if it were given here openly.

Senator HARRIS. Of course it would only be printed next winter some time.

The WITNESS. I would much prefer to wait until then, anyway. I would rather wait and have it published then, and I would much prefer if you will let me speak to you alone, because I can give you the entire insight of the business and the preparations, and I feel sure I can convince you that these preparations are not only harmless but actually beneficial.

The CHAIRMAN. Of course you would not object to the presence of Dr. Wiley?

Answer. No, sir; I would be glad to have him present.

The CHAIRMAN. The chemist of the Department, who is here with us?

Answer. I would be glad to have him present.

Senator HARRIS (addressing the chairman). Mr. Chairman, I don't think that that is an unreasonable request. He is perfectly willing to furnish the commission with all the information which it desires, but there is no reason why it should be made absolutely in public. The evidence goes in and will be published hereafter.

The CHAIRMAN. Then Mr. Heller may stand aside for the present. (The witness was withdrawn from the stand temporarily.)

STATEMENT OF JAMES F. SOMES.

JAMES F. SOMES, being first duly sworn, testified as follows:

Examination by the CHAIRMAN:

The CHAIRMAN. What is your name?

Answer. James F. Somes.

The CHAIRMAN. What is your business?

Answer. I am selling butter, eggs, and cheese.

The CHAIRMAN. Where is your place of business?

Answer. 44 Fifth avenue.

The CHAIRMAN. Do you sell oleomargarine?

Answer. Yes, sir.

The CHAIRMAN. Are you familiar with the law in regard to the sale of it?

Answer. Why, somewhat.

The CHAIRMAN. Mr. Somes, I show you an exhibit, which is designated "No. 4." Do you recognize it as from your place? [Handing same to witness.]

Answer. We sell something of that kind, similar to it.

The CHAIRMAN. Is your name on the paper?

Answer. Yes, sir; I guess so. [The witness examined the wrapper.]

Yes, sir. Not my name; it is the name of the Ohio Butter Company.

The CHAIRMAN. You represent that company?

Answer. Yes, sir.

The CHAIRMAN. Did you put this package up yourself yesterday?

Answer. I don't know. I put up one or two packages of the kind yesterday. I may have done so. I don't know.

The CHAIRMAN. Do you know what there is in this?

Answer. It is supposed to be oleomargarine or butterine.

The CHAIRMAN. Do you remember what was called for when that was furnished?

Answer. No; I do not. I would say in that connection that the majority of people come in and want oleomargarine or butterine. They do not ask for it. They say, "Give me some butter," and they know what they are getting, most of them, when they are getting this butterine.

The CHAIRMAN. What is the price of this butterine?

Answer. Butterine runs from 15 to 18 cents.

The CHAIRMAN. Then if a man says he wants some butter, you hand him out oleomargarine?

Answer. Not always; no, sir. We try to do a fair business and to do an honorable business.

The CHAIRMAN. What we want in this connection, Mr. Somes, is to find out—we are investigating the question of the adulteration of food products and how they are circulated. We are not seeking to incriminate you or anybody else.

Answer. I would say this: That I think the majority of my customers understand that they are buying butterine or oleomargarine. For a long time I stamped my packages all on the outside, and they would come and say, "What is this? I don't want this. Give me another wrapper." They knew what they were buying. They did not want to carry it along the street with a sign on, and to accommodate them I had to do it, and to wrap another wrapper around them. And then the butterine people, or the agents of the butterine people,

advised me that it was not necessary; that if I stamped my paper, that was all that was required. And I have always tried to stamp my paper properly and to see that it was properly stamped. There was no intention on my part to deceive anybody. The majority of the people want butterine, and they don't want a sign on it so that everybody knows that they are buying butterine. People are fussy about such things. And I think the reason they buy it is because it is the only thing they can get that is sweet and good.

The CHAIRMAN. We will excuse you.

STATEMENT OF RICHARD POLLAK.

RICHARD POLLAK, being duly sworn, testified as follows:

Examination by the CHAIRMAN:

Q. What is your name?—A. Richard Pollak.

Q. What is your address?—A. 37 Fifth avenue.

Q. This sample of butter or butterine purports to have been bought at your place yesterday. Did you sell it yourself?—A. I don't know whether I did or not. Often I do sell them and oftentimes I do not. Sometimes there are other men there who sell it.

Q. What is this, butter or butterine?—A. That is oleomargarine, butterine?

Q. And this is the paper it was wrapped up in?—A. It must be stamped with my name on there. [After examination.] Yes; it is.

Q. Is that the way you stamp them, when you put it in the corner and turn it down that way?—A. Not exactly, not that I know of.

Q. It is not your habit at all to sell one kind of food for another?—A. No; we only sell oleomargarine. We do not sell very much of it. Our principal trade is the meat business.

Q. When this was ordered at your place yesterday, the gentleman who ordered it states that he called for creamery butter, I think, was the word. Do you furnish that to people when they call for creamery butter?—A. No.

Q. What is the price of oleomargarine?—A. Oleomargarine runs from 13 cents. That is what we pay for this (indicating the sample).

Q. That is, he paid 13 cents?—A. Thirteen, I think it is. I am not certain.

Q. What was butter worth yesterday?—A. Butter was worth about 18 cents.

Q. Do you remember what you charged for this?—A. Eighteen cents a pound.

Q. Then you sell this at the same price you do butter?—A. We do not handle any butter, because we can not sell enough of it, and it is liable to spoil before we get rid of it.

Q. You pay 13 cents for this and pay 18 for butter?—A. Yes, sir.

Q. Then, as a matter of fact, if a customer comes in there and asks for creamery butter you sell him this?—A. I don't know about this here. We do not sell creamery butter for 18 cents, though.

Q. You do not sell creamery butter at all, do you?—A. No; not unless it is a special order; then we do get it.

Q. Are you familiar with the internal-revenue law, which says you shall mark each package so that it can be seen?—A. To a certain extent, I do.

Q. You consider that marking it in the corner in this way and turn-

ing it down is a compliance with the law?—A. The paper is generally marked on one end. That is supposed to be on top, and when you get through here and roll this in this way that corner will be on top (indicating). I do not know who wrapped that up. I am not in there half the time.

Q. As a matter of fact, yesterday you had no butter at all on sale?—
A. No butter.

Q. And if a gentleman came in and asked for butter you gave him this?—A. Not exactly. If a gentleman wanted butter, we have not got it—that is, if I know about it.

Senator HARRIS. Mr. Pollak, is this oleomargarine known in the trade as creamery butter; is it dealt in or recognized as creamery butter?

Answer. Not that I know of.

The CHAIRMAN. Did you have anything about your place to indicate that you were dealing in oleomargarine?

Answer. Why, I did not have any signs or anything like that. We have a license.

Q. What sort of a package do you keep these rolls in?—A. I believe they are in 30-pound pails.

Q. Rolled up separately?—A. Each roll is separate in the large package.

Q. Where do you keep that package?—A. In the ice box.

Q. Can your customers see that package?—A. Yes; if they come in past the partition. There are signs on the outside.

Q. A man who wanted to could look in and see where you get it?—A. Certainly.

Senator HARRIS. The original package is marked oleomargarine or butterine?

Answer. Oleomargarine on the original package.

Q. On the original package?—A. There is a revenue stamp on there according to how many pounds there is in the tub. We generally keep it outside, so people can see it, but now we keep it in the ice box. That is the difference.

STATEMENT OF AUGUST CLIFF.

AUGUST CLIFF, being duly sworn, testified as follows:

Examination by the CHAIRMAN:

The CHAIRMAN (addressing the witnesses). You gentlemen all understand that this committee is only wanting to know the facts that relate to the sale of adulterated foods, how they are sold to people without due notice, and there is no disposition to either injure your business or get you to criminate yourselves; and if any witness is asked any question the answer to which might incriminate himself, he has a right to decline to answer. The committee can not, under the law, compel him to answer anything that might incriminate himself.

Q. What is your name?—A. August Cliff.

Q. Where do you live?—A. 1454 West Park avenue.

Q. What is your place of business?—A. 68 Randolph street.

Q. What is your business there?—A. I am a manufacturer of a complete line of pickles and horse-radish as well, and sell them there to the consumer as well as to the grocery stores throughout the country.

Q. Do you sell oleomargarine?—A. I do, sir; yes, sir.

Q. You are familiar with the law in regard to oleomargarine?—A. Partly, unless there is a new law passed of which I am not informed.

Q. On yesterday there was brought before this committee, Mr. Cliff, a package of oleomargarine which a witness testified he purchased in your place, covered by this paper [indicating same]; and I will say, for the benefit of the record, that there were two papers around it. Do you recognize that as a kind of wrapping paper you use [handing same to witness]?—A. Well, we have three or four kinds. In fact, we have different colors as well. I could not say whether that is the paper or not. However, by that circular [indicating a circular inclosed with the contents of the package] it indicates that it came from our place, because that is the way we advertise our goods.

Q. Can you show to the committee any place on that paper, any mark, which indicates?—A. Not on that. If there was not any other one, I can not.

Q. Do you not wrap paper like that [showing to the witness another folded paper]?—A. Yes, sir; we have three or four colors of paper; straw paper as well as this; yes, sir; different colors.

Q. That is a package and the wrappers to it just as it came from your place. Is there any mark on the inside of this envelope showing that it is oleomargarine?—A. No, sir; there is not. We marked it on the paper.

Q. Can you tell the committee how it happened in this particular case that you did not mark it at all?—A. I do not know why—it should be all marked, according to the instructions of the house—unless there was a piece torn off.

Q. No; it was done up in the package and brought here by the witness just as those packages are.—A. The instructions are that every piece of paper shall be plainly marked.

Q. Do you manufacture oleomargarine?—A. Oh, no; a complete line of pickle products.

Q. Do you manufacture the Dundee Farm creamery butter?—A. We have a contract with a party to that effect, to furnish us the same.

Q. Is that butter or oleomargarine?—A. That is butter.

Q. Then you sell both butter and butterine?—A. And butterine; yes, sir.

Q. And if a customer comes in and asks for creamery butter, would you sell him oleomargarine?—A. Not if I knew it.

Q. You would be pretty apt to know it, wouldn't you?—A. If I waited on the customer, I would know it. If he wants butter, he gets it; and if he wants butterine, we give him butterine.

Q. What was the price of butter yesterday?—A. Eighteen and one-half cents is what I paid for some.

Q. What you paid for butter?—A. Yes, sir.

Q. What was oleomargarine selling for yesterday?—A. From 16 to 17 cents, in 5-pound pails.

Q. Do you remember whether you waited on that gentleman there [indicating Mr. C. Y. Knight]? Do you remember seeing him yesterday?—A. I do not remember. I remember seeing him somewhere, though, but not yesterday.

Q. Have you any explanation to make how it would be possible that you could sell oleomargarine to a man who called for butter and then not mark the package?—A. It looks as if it was torn off. Whether it was done in the store to make a smaller package out of 1 pound and torn off wrong is possible.

Q. You have those papers already stamped?—A. Sometimes. Not all the time.

Q. Do you advertise to deal in oleomargarine at all?—A. To some extent, yes, sir. We advertise it and sell it for that.

Q. Do you have any signs in your store?—A. The Government sign and then a sign "Butterine Department" as well.

Senator HARRIS. You are a manufacturer of pickles, Mr. Cliff?

Answer. Yes, sir.

Q. You buy all of the materials which enter into the making of pickles and put them through the pickling process?—A. We make contracts with the farmers for pickles and cut them up and prepare them.

Q. You get pickles in brine?—A. In salt; yes, sir.

Q. What kind of vinegar do you use?—A. We buy it from Bunge and Mr. Henning. We have a contract with them. White-wine vinegar is what we use.

Q. Do you take any steps to ascertain the character of the vinegar that you buy?—A. We investigate it as to whether we get full strength. That is as far as we can go.

Q. There are various elements that enter into the make-up of vinegar. Do you insist upon cider vinegar, pure cider?—A. We use lots of cider for our piccalilli.

Q. And you use other kinds of vinegar for other purposes?—A. Only white wine and cider.

Q. You make every effort to ascertain that you get that class of vinegar?—A. Oh, surely. Our reputation depends upon it.

Q. Do you use any coloring matter whatever?—A. None whatever. We have no necessity for using it.

Q. Very frequently, I believe, various substances are used to produce a bright green color in pickles.—A. Some folks do it, but it is only done for export trade, where it is supposed to be for export trade, to keep its color. It is not necessary for local goods.

Q. What are the substances used for that purpose?—A. There are lots of chemicals manufactured by Merck & Co. which they use in Germany. They ship it to this country and sell it to the drug houses.

Q. Those things are imported?—A. Yes, sir.

Q. Do you know of any manufacturer of such things in this country?—A. Well, there are a good many of them use it, but they keep it secret to themselves.

Q. There are none of these deleterious or foreign substances that are openly manufactured here, are there?—A. No; that is all done through the drug trade—handled through the drug trade.

Q. Is alum used sometimes?—A. A good deal; yes, a good deal of it.

Q. In the manufacture of pickles?—A. Yes; for export trade especially, and to stand a long time on the shelf, they do use it.

Q. Isn't it used a good deal here in pickles which are sold here in the United States?—A. Not to my knowledge. They would not have to.

Q. Copperas is sometimes used?—A. Yes. They prepare them in copper kettles and cause them to turn green.

Q. You do not use any such things yourselves?—A. No, sir.

Q. Your pickles especially do not have that bright green look?—A. No, sir; the natural color.

Q. Of course it is affected by vinegar, which makes the natural color darker, I believe.—A. When you use cider it will; yes.

Q. Do you see in the trade occasionally these artificially colored pickles?—A. No; I do not. Only on import goods and goods which

are supposed to stand on the shelf a long time. I see it occasionally in stores.

Q. That is what I mean. You see those things in the stores which your experience tells you have been artificially colored?—A. Yes.

Q. In considerable quantities?—A. Well, yes. All those goods which are shipped in here and are supposed to be kept for a long time on the shelves are that way.

Q. And you think that is confined to the imported goods?—A. The exporters do it as well.

Q. On both import and export goods?—A. Yes.

Q. Which we manufacture for export?—A. Yes.

Q. But you think that is not done by anyone for sale here at home?—A. No; not here at home. I see that in goods coming in from the outside.

Q. You use capsicum a good deal, do you not?—A. Not to a great extent. I use some.

Q. Red pepper?—A. Yes. I use peppers which we buy from the farmers out on Randolph street, and we make contracts for them down in South Carolina.

Q. You buy the red peppers from the farmers and grind it yourselves?—A. Chop it up; yes, sir.

Q. You do not buy any of this ground capsicum of the spice mills?—A. Never use that at all, because that is no good anyway.

Q. You think it is not worth using?—A. You do not get the strength, and therefore it would be wasted time to work with it.

Q. It is mixed with something which weakens it down so that it is of no value?—A. They use ground meal and color it up, and everything else.

Q. Paint it all over?—A. I would not have anything like that.

Q. That, you think, is the custom generally with the spice-mill manufacturers?—A. Only with the cheaper class, not with the better class.

Q. Of course, if you pay enough for it you can buy capsicum which would be practically pure?—A. Not for the price that they sell it.

Q. They do not have any listed price which would justify that? You mean they do not offer to the trade at a price which would warrant them in selling a pure article?—A. Yes; they have them, if you pay for them. That is all that is necessary.

Q. You think that they simply respond to a demand for a cheap article?—A. Yes; with cheaper people they do so.

Q. This horse-radish. Is there ever any adulteration used in horse-radish?—A. There is considerable; yes.

Q. What is the general adulterant?—A. They use Indian turnips to fill up the bottle and give it the color of horse-radish.

Q. Indian turnips. You would not regard that as perfectly healthy?—A. There is nothing injurious in it, but it is a misrepresentation on its face.

Q. I believe the medicinal qualities of the Indian turnip are such as to produce giddiness and vertigo?—A. It is healthy.

Q. It is not very healthy to have any symptoms of that kind, is it?—A. Well, you can eat some of it. If you eat too much of it, it is very unhealthy. The United States Dispensatory tells us it is very good to a certain extent.

Q. It is prescribed as a medicine sometimes; but so is strychnine and so is arsenic?—A. That is right.

Q. They are occasionally used, but we would not like to have any-

thing of that kind in what are commonly known as foods.—A. Not exactly. It does not belong there.

Q. So that that would be an adulteration that ought to be prohibited.—A. That has been going on for the last fifteen years, and I have been making it for fifteen years, and I have a good deal of trouble to buck against people who are putting up turnips.

Q. Of course ordinary turnip ground up would be a great weakener. It would simply weaken the strength of it?—A. It has not strength. It is a cheaper substitute.

Q. It would simply weaken the strength and probably would not have any bad effect?—A. The strongest horse-radish is too bitter.

Q. That is used also?—A. Yes, sir. It is too bitter. It is not good for the stomach at all.

Q. Is the bulk of the horse-radish that is on the market adulterated, in your opinion?—A. To some extent. I would not say the bulk. To some extent. There are lots of honest people who are putting up good goods.

Question. Those are the ones we want to protect.

The WITNESS. It loses its strength very rapidly.

Q. Unless it is kept hermetically sealed?—A. Even then it does. Light and sun have an effect on the goods, the same as pickles.

Q. In your chowchow, of course, you use a large amount of mustard?—A. Yes; I do.

Q. Do you get that from the spice mills?—A. No; I do not. I have a contract with a man in New York, and he has been furnishing it to me, and also Cross & Blackwell, and a good many people in this country as well, who find it very satisfactory.

Q. It is manufactured in this country?—A. By Charles Gulden, in New York.

Q. And he exports his mustard to Cross & Blackwell?—A. Some of it; not all.

Q. He has the reputation as a manufacturer of pure mustard?—A. Yes; chowchow.

Q. Did you ever analyze any of these things to ascertain?—A. Yes, sir.

Q. You have tested this mustard?—A. Yes, sir.

Q. And taken pains to see that it is up to the standard?—A. Yes, sir.

Q. Take such an article as you have here as East India relish. That substance is composed of various substances which stimulate the appetite?—A. Green tomatoes and green peppers are the foundation of it.

Q. And the peppers you buy from the grower?—A. From the farmers; make contracts for them.

STATEMENT OF WILLIAM BROADWELL.

WILLIAM BROADWELL, being first duly sworn, testified as follows:

Examination by the CHAIRMAN:

The CHAIRMAN. What is your name?

Answer. William Broadwell.

The CHAIRMAN. Your business?

Answer. I have two or three lines of business—butter and cheese business, race-horse business, and so on and so forth.

The CHAIRMAN. Which one of them do you carry on at No. 193 West Madison street?

Answer. Butter and cheese.

The CHAIRMAN. Do you sell any oleomargarine?

Answer. Yes, sir.

The CHAIRMAN. Were you present yesterday at your place of business?

Answer. Yes, sir.

Senator HARRIS. Do you say your business there is butter and cheese?

Answer. Pure butter, oleomargarine, and cheese.

Senator HARRIS. Have you seen this sample which was produced here yesterday? [Referring to one of the samples of butterine produced before the commission on the previous day by Mr. Knight.]

Answer. No; I have not. I just noticed the paper. I noticed that the stamp was quite plain. That is my stamp.

Senator HARRIS. It would not be quite so readily seen, would it, if it should be folded in this way. [Referring to the manner in which the wrapper was folded when presented first to the commission, the corner on which the word "Oleomargarine" was stamped being turned over, so that the word was not visible.]

Answer. I will tell you, your honor. There are two ways of explaining that—a mean way and a good way. This gentleman sitting here explains it the mean way, but I explain it the good way.

Senator HARRIS. When you say "this gentleman," whom do you mean?

Answer. I just saw him here a minute ago, some place.

Senator HARRIS. Is that the gentleman? [Referring to Mr. Knight.]

Answer. That is him, right there; he is the fellow. He can wrap it one way and I can wrap it another. I can wrap it this way, so that it will come on the outside. He can wrap it so that it will come on the inside. It is just the way the man might take it.

Senator HARRIS. Yes; but, Mr. Broadwell, this package was opened here yesterday from what seemed to be an original package.

Answer. It might have been opened before it got here, your honor. Do you see the point? They ain't no honester than I am. I believe my men put that stamp on there as plain as they can put the ink on the page every morning, and any man that don't do it I will fire him. They have been after us a long time, this man here has? [Referring to Mr. Knight.]

Senator HARRIS. Does that look like a package from your place?

Answer. Well, sir, I could not state that unless I see it unwrapped, and see if it has my name on it. It does not look like mine, because the stamp is not on the outside; but it could be remodeled and rewrapped, and the stamp could be put on the inner side.

Senator HARRIS. If he called there yesterday for creamery butter and you sold him this—is it your habit when they call for butter to sell them oleomargarine?

Answer. When a man says, "I want strictly A No. 1 pure butter," we show him pure butter, and if it is good enough for him he buys it. If it is not, we show him something else. If he prefers this oleomargarine in preference to pure butter, we give him that. We tell him to taste it, and if it suits him he pays us for it, and if it doesn't suit him he gets out. We have pure butter and butterine also, and if a man will taste of both and prefers this in preference to pure butter, that is what he wants. We have more trouble with our pure-butter customers bringing pure butter back, and then they will go to work, and they don't want any butterine, but if we let them taste of it, and

ask them, "Does that suit you?" they say, "Yes." Then they take it home and become steady customers all the time.

Senator HARRIS. They like the oleomargarine?

Answer. That is the only thing they like and the only thing that will keep and give the poor people satisfaction. That is the poor people's friend. He [referring to Mr. Knight] is the rich man's friend. That is true as you live. He wants butter to be worth 60 cents a pound, and us poor devils have got to go without.

The CHAIRMAN. This committee is not examining into the moral turpitude of any gentleman, only so far as it relates to the circulation of impure food or of food that may be pure which is sold as a substitute for some other food, and we are anxious to know just how much butterine is sold for butter.

Answer. That is all right.

The CHAIRMAN. Where do you keep your box that these packages came in.

Answer. Right in front of the customers and in the original package. There is no excuse for me to do things contrary to law, because I make it a study. The law reads you must not take oleomargarine from the original stamped package before selling. It is taken out right before the customer's eyes, taken out of the original stamped package, and the package is stamped, and it goes on in that way until the box is empty and then it is scratched and made way with. You can see that stamp on every paper and every package that goes out of the store. I would almost stake my life that you will find it, as plainly as you see it there, on every one.

The CHAIRMAN. When this paper was opened here it was folded just in this way [indicating]?

Answer. Yes.

The CHAIRMAN. You can not see it.

Answer. As I say, it can be folded in a number of ways.

The CHAIRMAN. But you say you do not fold it that way.

Answer. They are folded with the stamp on the outside. That there [indicating] is quite large. That ought to be folded to a point, to make the package look nice, so there would be a small portion of the red ink across the top, and the balance would be folded on the inner side. You can call that folded under the inner side or on the outside, just as you are a mind to figure.

The CHAIRMAN. That does not have the appearance of ever having been opened, does it?

Answer. No; it does not look like it there; no—of being opened.

The CHAIRMAN. It does not look like it had ever been opened?

Answer. My friend, there are scientific deals in all kinds of business. I will tell you that they are pretty slick—that is, they think they are.

(The chairman here opened the package above referred to.)

The CHAIRMAN. That is folded to a point, is it not?

Answer. Yes.

The CHAIRMAN. It makes what you call a neat and business-like package, does it not?

Answer. The way it is there. It was tried to be made so. I will stake my life that that is stamped, if that is the paper I sold it in. They done a nice job. The stamp is real large, too.

The CHAIRMAN. Now, Mr. Broadwell, do you say that that was not folded that way when in your store?

Answer. Not to my knowledge, because I don't think that I wrapped

it up. If it was wrapped that way, it was wrapped against my wishes, and, of course, when a business man is passing—I would not swear to it without I saw it myself. The grade of oleo that there is in that package is as good as I made, and it is sold for a low price, not for a butter price.

The CHAIRMAN. What was this sold for yesterday?

Answer. Fifteen to 18 cents is the price. I don't know what that gentleman paid for it.

Mr. KNIGHT. Eighteen cents I paid for it.

The CHAIRMAN. Do you know what makes the difference in the price?

Answer. The difference is on account of the difference in the grade and quality.

Senator HARRIS. Do you think the difference in the price is a notice to the purchaser?

Answer. Yes, sir.

Senator HARRIS. The difference in the price between that and the price of pure butter?

Answer. A man who pays 15 and 18 cents for butter knows what he is getting, because he knows if he goes into a grocery store he has got to pay 20 and 25 cents for A No. 1 butter.

Senator HARRIS. But he might not know what pure butter was worth.

Answer. If he goes in and asks the question he will find out right away, quick.

Senator HARRIS. Ordinarily, when a man simply goes in and asks for butter, you are just as apt to show him that as to show him anything else?

Answer. We show him both kinds, and let him take his pick.

Senator HARRIS. You tell him which is which?

Answer. We show him the oleo right from the original stamped package and the pure butter, and then let him take his choice.

Senator HARRIS. You simply hand them out to him, whichever he may ask for?

Answer. We show him the pure butter, and then I say, "I have got something else, and you can taste it and see if it suits you."

Senator HARRIS. You tell him that you have pure butter or oleomargarine?

Answer. Yes, sir. And we have advertisements all over the store. Probably more signs in my store than in any other store in Chicago, "Oleomargarine and pure butter."

Senator HARRIS. You think you could sell just as much oleomargarine as if the word "butter" was not used at all?

Answer. You don't have to tell them a thing. They like it. They love it.

Senator HARRIS. Well, a rose by any other name is said to smell as sweet.

Answer. I don't care what you call it, they would buy it just the same. Some millionaires, too, with plug hats on, would buy it, too. If I should tell you some people in this town, it would scare you to—they know what they are buying, and they try to jew me down and buy it for 10 cents less on the pail.

Senator HARRIS. That is the way they became millionaires, probably. I very much prefer butterine, although I am not a millionaire, to bad butter.

Answer. That is the point; we can not get good butter.

Senator HARRIS. You can not get good butter because the price is too high?

Answer. No; it is not that. You take the finest of creamery, and the way the general run of people keep it in their pantries it only lasts a couple of days and then it turns strong, and they fetch it back to you and say: "This is oleomargarine."

Senator HARRIS. Have you ever heard of a preparation called "Freezine?"

Answer. No; I never have.

Senator HARRIS. Or any preparations which are supposed to prevent this rapid degeneration of butter?

Answer. No; I never did. I have seen in cold storage, at the time that these cases came up in court—I was taken over there and shown butter that I could see the streaks where the real, genuine maggots crawled through it.

Senator HARRIS. What I want to get at is whether in your trade—the subject which I am following up now is whether any artificial preservative, any antiseptic preparation—

Answer. Not in the least.

Senator HARRIS (continuing). Is used to keep or preserve butter? You don't handle milk or cream or anything of that kind?

Answer. No, sir.

Senator HARRIS. And you know of nothing that is used to preserve the good qualities of pure butter?

Answer. I am probably the largest dealer in Chicago in this line, and probably sell more than any three or four stores in this town, alone. I buy it fresh every morning, and it goes by that same night. I don't buy a quantity ahead. For that reason I have no complaints about this article. I don't store it.

Senator HARRIS. You use it up as rapidly as you buy?

Answer. Yes, sir; pure butter and oleo also. We call it "oleo" for short.

Senator HARRIS. The oleo does not change with time or temperature?

Answer. No, sir.

Senator HARRIS (continuing). Nearly so rapidly, at least?

Answer. No. I find that a pail of oleomargarine will last a month in warm weather, during July and August, when pure butter would be brought right back in two or three days, and they would say, "This is oleomargarine. I can tell by the smell of it." It shows they are ignorant, or they would not say it. They fetch it back, and take away a pail of oleomargarine, and become regular customers.

Senator HARRIS. It is merely a matter of choice, and there is no way known to the trade by which pure butter can be kept in warm weather?

Answer. There is no way on earth to keep it, because you take and put it in an ice box, it is not cold enough. I don't care how good the quality is, it will not keep. I have sold as good butter as money could buy, and I have had it returned to me within a limit of three days in hot weather.

Senator HARRIS. Don't you think the word "butterine" was coined with a view to deception?

Answer. It was once upon a time, and that is the reason they changed it. We are not allowed to use the word "butterine" now at all.

Senator HARRIS. You don't use it now?

Answer. No, sir; I never mention the word "butterine." It is "oleomargarine" or "pure butter," one of the two. That is the reason they changed that name, so that people could not be beat in that way.

Senator HARRIS. You think, generally in the trade, there is a disposition to sell the oleomargarine on its merits?

Answer. Yes, sir; and a man don't have a particle of trouble.

Senator HARRIS. Without attempting to conceal its true character or sell it as butter?

Answer. Don't have to, at all; but there is a class of people that come into my store, who are up in the world and who have got lots of money, and they come in and call for a pail of butter the same as they had before. They would not come in and ask outright for oleo.

Senator HARRIS. If it has the merit that you claim for it, why should people object to saying "oleomargarine?"

Answer. They don't want the man that is next to them to know that they are using oleomargarine.

Senator HARRIS. They think there is some social degradation in it?

Answer. I should say there was. If you only knew that much about the class of people that buy that in my store, you would almost fall dead, as true as you are living.

Senator HARRIS. I don't see anything humiliating or embarrassing in the purchase of an article which is good and satisfactory to the taste and which will retain its good qualities. Of course I am a mere countryman, but I don't see why a man should not come in and say "I want some oleomargarine, because it suits my palate, and because it will keep longer than butter."

Answer. Yes; but they don't want to let anybody else know anything about it, and they will come in and call me off to one side and whisper to me, "Can't you make it 10 cents cheaper this time?" You'd be surprised, I tell you. I don't want to call any names, but I tell you it is dreadful. Then, do you think they don't know what they are buying? And then they ask me about the goods I handle; that I shall see that they don't get Swift's or Armour's. I tell them I handle Moxley's, and Braun & Fitts's. All right then, so long as it is theirs.

Senator HARRIS. There are different grades, even in the nobility of oleomargarine?

Answer. That is what there is.

Senator HARRIS. Some is good, and some is better.

Answer. There is some that I would not handle at all. It might be all right, but in my opinion it is not.

Senator HARRIS. What do you think makes the difference?

Answer. Well, of course there is a certain kind of cream and butter that is put into the higher grades that make it sweeter and nicer, and a better smell and taste to it.

Senator HARRIS. Would not that have a tendency to make it deteriorate, the more butter that was in it?

Answer. There is not enough butter put in it to turn it. There are other articles put with it to keep it.

Senator HARRIS. It does not get so good as to be hurt by it?

Answer. It is just like a man making coffee; rubs the coffee can up against the grounds, and that is as near as the coffee gets to it.

Senator HARRIS. You say that this mixture is what makes the higher grades of oleomargarine?

Answer. Yes, sir; it gives it a nicer, sweeter taste, and a nicer flavor.

Senator HARRIS. Makes it better?

Answer. Makes it better; but I think the inferior quality will keep longer.

Senator HARRIS. It is a contest between flavor and quality and durability?

Answer. Yes, sir.

Senator HARRIS. And if you improve the quality and flavor, you do it at a certain expense of durability?

Answer. Yes, sir.

Senator HARRIS. And permanence?

Answer. Yes, sir. I never handle any cheap grades at all whatever. I never did in my life and never will. That is the reason I do the business I do.

Senator HARRIS. Do you think there is anything else used in these inferior grades of oleomargarine?

Answer. No; I don't think there is, because it is composed mostly of tallow—

Senator HARRIS. The nearer they come to tallow the more permanent it is?

Answer. Yes, sir; because I never saw a piece of tallow spoil in my life. I don't think there is any such thing as its spoiling.

Senator HARRIS. You never have seen rancid tallow?

Answer. I don't know as I ever did. There might be such a thing, but I don't know as I ever saw it. The more cream you put into oleo, the shorter time it will keep. That is the way I figure about it.

Senator HARRIS. It is a balancing between the two qualities?

Answer. Yes. And seeing as I have such a terrible big trade, and I get it fresh every morning, I never have any complaints.

Senator HARRIS. But there is a disposition, for social reasons, to stick to the old-fashioned word "butter?"

Answer. There is a millionaire comes in, and he says he wants another pail of butter for a dollar twenty-five.

Senator HARRIS. How about the fellow who is not a millionaire?

Answer. He is just as proud as the millionaire.

Senator HARRIS. The fellow who works for \$1.50 a day—does he care whether his package is labeled "oleomargarine" or not? Does he object to it?

Answer. I never saw one that ever did.

Senator HARRIS. And he will come in and walk right up like a man and ask for oleomargarine?

Answer. Yes, sir. And I have had them come in and discover the stamp—the stamp would be on the outside—and they say, "Here, I don't want any more butterine." I say, "All right; I will show you all kinds." And I will get 6 or 8 pails out and say, "Take your pick," and he will pick out butterine ninety-nine times out of a hundred.

Senator HARRIS. But he does not want butterine?

Answer. No. And I have to say, "Here is butter and here is butterine; which will you take?" He says, "That tastes the finest I ever saw in my life; I guess I will take that." And that settles his argument. He never argues any more.

Senator HARRIS. There is a prejudice against the name among all classes?

Answer. Among all classes in regard to calling for it.

Senator HARRIS. Against the use of the name?

Answer. Yes, sir. I knew of a gentleman the other day; I met him

out on the west side, and another man says, "How do you know this man here?" and he said, "I buy butterine from him." And he is a millionaire, too.

Senator HARRIS. He was not afraid.

Answer. No; he was not afraid. He did not care. But he would not come into my store and call for oleomargarine in front of a crowd; but he will go outside and say, "I buy oleomargarine from this man." He buys it for 15 cents.

Senator HARRIS. Do you think a man is entitled to know just what he is getting?

Answer. Certainly he is.

Senator HARRIS. In your business you offer him every opportunity to know?

Answer. I do so much business I don't have to lie to him. They buy it anyway. I don't have to lie to him. I am doing the real, genuine thing in Chicago, and I don't have to lie for it. And I am making the money. I don't have to lie to them. If they don't like it, let them go somewhere else and get beat, and then they will come back to me later.

Senator HARRIS. You have no knowledge of any practice or custom in your establishment of folding the corner of the paper, such as we have seen?

Answer. Not in any way, shape, form, or manner.

Senator HARRIS. No such idea as that is given out to your employees?

Answer. We had some trouble about folding the paper. I will show you how it can be folded in, in many ways. We will suppose the stamp is on this corner [illustrating], and the stamp comes from this end, as you see, down to this—comes right around the outside. You can take that and fold it over like that [illustrating], on the outside, and still it is on the outside. I don't do it, but they done it, and they claim it is folded on the inside. Do you see it is right here, across this top? Then they take it and fold it like that [indicating], and fold it in again, and you see it is on the inside.

Senator HARRIS. That is done with a stamp?

Answer. Yes.

Senator HARRIS. And you put your rubber stamp on the pad and then put it on the paper?

Answer. Yes, sir.

Senator HARRIS. It would be a simple matter, when the package is wrapped up, to put that stamp on the outside, would it not?

Answer. Yes, sir. Then they take it and turn the paper over, and put the word "oleo" on the other side, and put it on the inside.

Senator HARRIS. So far as you are concerned, that would be the simplest possible way?

Answer. Yes, and many times, just as soon as he makes the discovery that this is oleo, on the outside, he says, "Put another wrapper on it, to hide it." They don't want to be walking along the street showing people that they are buying oleomargarine, but still they want it. When this new law came up, about a year ago, I went to sell pure butter, and it came back just as fast as I sold it.

Senator HARRIS. It did not have keeping qualities.

Answer. No, sir; it did not have keeping qualities, and I never saw any that ever did have.

The CHAIRMAN. This resolves itself into a question of veracity between you and this gentleman. [Indicating Mr. Knight.] In other words, he says he bought these two packages from your store.

Answer. Yes, sir.

The CHAIRMAN. I have opened both packages in the presence of the committee, and they were both folded—

Answer. Yes, sir.

The CHAIRMAN. Each folded in the same way. Now, what is your explanation? That it has been changed after it left your store?

Answer. It must have been, without this man that I have there has a new way of wrapping them up, and contrary to my advisement. Of course a man can go on and pick for a flaw, such as he has done, and make trouble and string it along if he wishes. And, as I say, a man can wrap it up a dozen different ways and bring it up here and swear that he got it that identical way. I would not say that he did it, but I have my opinion. He is getting pay for this, you know, and I am not.

Senator HARRIS. There is one question I want to ask you further. The pure butter which you sell is wholly or partly colored, or how is that?

Answer. Some of it is as yellow as gold.

Senator HARRIS. What proportion of it is artificially colored?

Answer. I could not just state; there is a good deal of it, because in January butter is as white as snow almost, very nearly, and we get it yellow in the winter time.

Senator HARRIS. If genuine butter were not artificially colored, would it not be easier to distinguish it from oleomargarine?

Answer. Yes, sir; because all oleomargarine is colored.

Senator HARRIS. That is uniformly colored?

Answer. Yes, sir; uniformly colored, just as you see there. [Referring to samples of oleomargarine on the table.]

Senator HARRIS. And in the actual process of producing the genuine butter, the color varies with the season?

Answer. In January it would be almost white.

Senator HARRIS. In June it would all be about the same color?

Answer. No; in June you get the green grass.

Senator HARRIS. Then, I say, it would be the color of oleomargarine?

Answer. Yes, sir; and, as I understand, the two articles are colored by the same thing.

Senator HARRIS. There is a very decided contest, practically, between the creamery men and the manufacturers of oleomargarine, as to who shall have the exclusive privileges of coloring their product?

Answer. Yes, sir; I believe there is. These people [referring to the interests represented by Mr. Knight] want the oleomargarine men to quit coloring it, but they don't want to quit themselves. They want to live in glass houses all the time, and they want to protect the poor man. We charge 15 and 18 cents; they want 25 and 30 now. What would they get in cold weather—in January and February? They want to get 60 cents. They want to protect the poor man.

Senator HARRIS. If oleomargarine should be all colored pink, would that affect the sale of it?

Answer. You could not sell a pound of it.

Senator HARRIS. Why?

Answer. It kills it right there.

Senator HARRIS. Because everybody would know that it was oleomargarine?

Answer. Yes, sir. Just as I was telling you about the millionaire buying oleomargarine. We will suppose I invited you to my house to

take dinner, and I had some of this pink butter on the table. Would you eat it? You would say I was a cheap skate, wouldn't you?

Senator HARRIS. Very well. Then, practically, the oleomargarine has to masquerade as butter?

Answer. It has to resemble butter.

Senator HARRIS. It has to masquerade—it has to assume to be butter?

Answer. Not if you can whisper to the man it is all right.

Senator HARRIS. That is just the same thing. Now, is it not the plain, palpable fact that oleomargarine is a fraud upon the public?

Answer. No, sir.

Senator HARRIS. In the sense that it is masquerading as butter?

Answer. No, sir; it is not, because I will tell you why. A man will come in and step up to you and whisper and say, "I want a pail of oleo." He is not going to go out in front of the push and say, "I want a pail of oleo."

Senator HARRIS. He is not willing to deceive himself, but he is willing to deceive his friends?

Answer. Yes, sir; just the same as when you come into my house to dinner and see this pink stuff on the table.

Senator HARRIS. If we are all in the same boat, why not throw aside the concealment? Why not simply let it be known, and make a distinctive color distinction?

Answer. Well, sir, it has killed it in other States.

Senator HARRIS. What effect does it have upon the price of butter? Suppose oleomargarine was colored pink?

Answer. It would run pure butter right up to 40 and 50 cents a pound, because the people would quit buying it for that one reason.

Senator HARRIS. You think that would be a great injury to the poor man?

Answer. Yes, sir.

Senator HARRIS. You are a friend of the poor man?

Answer. Yes, sir; I am a friend of the poor man.

Senator HARRIS. You said that, I believe.

Answer. There is not so much money in the butter business as people think; if that was colored pink it would be a dead letter.

Senator HARRIS. You think pure butter would practically go to such a price that the great masses of people would be forced to use the pink butter?

Answer. The people would do just as Mr. Weaver did, on South Water street—run all over the west part of town and buy this stuff, and put it in cold storage.

Senator HARRIS. Do you know whether they put acids in it to preserve it?

Answer. I understand that is what they put in poor butter.

Senator HARRIS. I asked you a while ago if you knew of any artificial method by which butter could be treated.

Answer. I misunderstood you. I understood you to say in regard to oleomargarine, about the acids.

Senator HARRIS. No; I said butter.

Answer. That is a different question. Yes; I have heard tell that there are acids put in.

Senator HARRIS. That there are antiseptic and other preparations used to preserve pure butter?

Answer. Yes, sir; I have been told so by people who handled it.

Senator HARRIS. You have never handled any yourself?

Answer. No, sir; I never have.

Senator HARRIS. Do you know anything about the character of this antiseptic preparation?

Answer. No, sir, I don't; but I know that they must have put some such stuff in it to purify that old maggoty stuff, the same as I saw in the tub.

Senator HARRIS. At least to kill the maggots?

Answer. You have got to put something pretty strong in it to do that.

Senator HARRIS. You have no knowledge whatever on that subject, have you?

Answer. No, sir; I have not. They—they know. [Referring to Mr. Knight's representatives.]

STATEMENT OF C. Y. KNIGHT—Recalled.

C. Y. KNIGHT, having been previously sworn, was recalled, and further testified as follows:

Examination by the CHAIRMAN:

Q. This package of butter we have just been talking about, Mr. Knight, which Mr. Broadwell says came from his store and which you say came from his store, I opened it here this morning. Had it been opened since you bought it before you brought it here?—A. You said "butter" there. May I correct you on that?

Q. Yes.—A. Oleomargarine. No; it had not. I bought it at about ten minutes of 6 last night, took it directly to my office, put it on the window sill, and left it until I came here this morning, hat and the three other packages there.

Q. Where were these packages bought?—A. Those were bought of the Ohio Butter Company, of Mr. Somes, who was here this morning. I called for creamery butter and paid 18 cents for it.

Q. Was Mr. Broadwell there?

Mr. BROADWELL. No; I was not there.

The WITNESS. It was already wrapped up. They took it from a box under the counter, at the farther right-hand counter, from among a lot of packages which were already wrapped and from the same place where I got the other in the morning, which I brought up here. I have not marked those. If you like, I will identify them.

(The witness identified the three packages by marking on them "C. Y. Knight, Ohio Butter Company.")

Q. Did you get these three packages at the same place?—A. No, sir; I got these at the Ohio Butter Company's place.

Q. All at the Ohio Butter Company's place?—A. These three. I wanted to find out whether it was an accident that they were turned under, or whether they were doing it right along.

Q. Have you opened these since you bought them?—A. No, sir; I have not touched them.

Senator HARRIS. I would like to ask a question or two.

The CHAIRMAN. Yes, sir.

Senator HARRIS. Do you know any process whatever which can be or which is used, by the use of antiseptics or anything of that kind, to increase the keeping qualities of butter?

Answer. Yes, sir.

The CHAIRMAN. I want to call your attention to this butter, and to the fact that it is not marked at all [handing package to the witness].

What did you call for when they handed you that?—A. Creamery butter. I would suggest that these will have to be analyzed, inasmuch as there is no mark on them to indicate that they are oleomargarine, to prove that they are not butter, although they came out of an oleomargarine box.

The CHAIRMAN. For the purpose of this investigation I suppose that will not be necessary.

The WITNESS. There it is on that one [indicating]; the same thing.

Q. The second one opened is stamped. You say you bought them all at the same place?—A. Yes, sir. I needed 3 pounds. I just came up Fifth avenue from my office, from South Water street right up this avenue, or rather I went down from here and took the stores which I passed. I did not go out of my way.

The chairman opened the third package.

The CHAIRMAN. Here is a stamp inside. So two of them are stamped and one is not.

Senator HARRIS. Will you tell the committee, Mr. Knight, fully what you know with regard to such preparations that are used?

Answer. The only antiseptic that I know of that is being used in butter is boracic acid, powdered and refined to borax, and that, so far as I know, is only used for the export trade.

Q. That would be mixed in with the butter?—A. Yes; about one-half of 1 per cent is mixed in with the butter, like salt. That is used universally from Australia, the butter that is shipped to England; in all the butter that goes from France to England; practically everything that goes from Ireland to England; and it was with that preparation that the Australians were enabled to send butter a distance of 10,000 miles into England.

Q. What about its use in this country?—A. The use in this country has been on the order of the importers to England.

Q. You mean for export from here?—A. Yes. An Englishman would order 4,000 or 10,000 or whatever number of boxes he desired of butter to be sent, and would order it put up in that way.

Q. It is supposed to be effective?—A. Yes, sir.

Q. There is difficulty here at home as to the keeping qualities of butter?—A. That is true.

Q. Why should it not be used just as much for home trade as for export trade?—A. There is a prejudice against it, and there are laws against it in different States.

Q. The States which have pure-food laws would prohibit it?—A. No. There are only two or three States that I know of. Michigan, New York, and Minnesota are the only three States I recall which have laws against the use of borax in preserving butter.

Q. It could be used in all of the other States?—A. It could be used in all of the other States; yes, sir.

Q. Do you think it is used?—A. Well, I am pretty sure that where an export order—

Q. No.—A. For local consumption?

Q. Yes.—A. I never have heard of any being used for local consumption.

Q. It is just as important to have butter with good keeping qualities for local trade as for export trade.—A. That is true, but at the same time there is a prejudice against it, and it will not be used except in cases where it is ordered.

Q. Can the buyer detect it?—A. No, the buyer can not detect it, but a chemist can very readily detect it.

Q. A chemist can detect oleomargarine, as a matter of course?—A. Yes, sir.

Q. You think that the creamery men are not willing to deceive the public in this way?—A. Well, for the domestic trade, I do not know of any call for an antiseptic in butter. We never have heard of it. You take, for instance, in New York, and in the New England States largely, and the butter-consuming States—you can hardly call Illinois a butter-consuming State—they report no trouble about the keeping qualities of butter that comes on in that way, and there is no trouble about the keeping qualities of the butter.

Q. Then you think the practice of the creameries is to use such an article as that where they have an order for export, and they refrain from using it for domestic use?—A. I do not believe, of the 8,000 creameries that there are in this country, that there are 10 which use an antiseptic. I know a good deal about that antiseptic business, for the reason that when I was in England a year ago I made a very close study of the reason why Australia could put butter into England and we could not compete with them, although we were only 3,000 miles away and they were 10,000 miles, and I found that boron preservatives were used in practically everything; and I am told by a gentleman who exports three-quarters of the Australian butter from Melbourne, who was here the other day, that it was used universally, and the English Government approves of the use of it up to a certain extent.

Q. You think the English public does not object to it?—A. The English public does not object to it except where there is agitation. Now, the Danish exporters of butter, because of their closeness to the English market, find it very easy to put butter into England without an antiseptic.

Q. The Danish butter, I believe, commands the highest price in the English market?—A. No, sir; it does not. The French butter commands the highest price. What is known as the Brettel-Frare butter commands the highest price in England.

Q. That is butter without salt?—A. That is butter without salt.

Q. And there is a preservative used in that?—A. Yes, sir; there is in that. But the most popular butter in England is the Danish butter. That is the most popular butter. It reaches the high, middle class. This French or Brettel-Frare butter is largely consumed by the bon ton.

Q. The epicures?—A. Yes, sir.

Q. The Danish butter, though, is the most generally used?—A. Yes, sir. That is the most generally used high-priced butter. Next to that comes the Australian, and then the Irish and Canadian, or rather, I should place the Canadian before the Irish.

Q. Do the Canadians use this preservative?—A. Not to any great extent, any more than we do here in this country. Just about the same, I should say. I know of Canadian importers who buy and take back Canadian butter in this country who order that put in their butter.

Q. Do you know anything about the quantity of this preservative used?—A. The quantity usually used, in the first place, is about 1 per cent—1 pound to the hundred pounds of butter. About half of that washes out in the brine, leaving about one-half of one per cent.

Q. Is it mixed with salt and worked into the brine?—A. Either that way or sprinkled over and worked separately.

The CHAIRMAN. You know our Secretary of Agriculture, Mr. Wilson, made some experiments in shipping butter to England?

Answer. Yes, sir; I am very familiar with that.

Q. He did not find it necessary to use any acid at all, did he?—A. No. I know the Secretary did not use any boracic acid or any preservative in his butter at all.

Q. And his shipments and experiments were a success?—A. I can not say as to that, sir, because, while I am very familiar with them, I am not familiar with the outcome. I do not know what the outcome was. We never have made a success, so far as that is concerned, of shipping fine butter to the other side, not because of any lack of keeping qualities or anything of that kind after it got over there, so much as from the fact that we could not give them a steady supply. Our home demand here fluctuates so and goes up and down with the tide of production and consumption, prosperity or hard times, as it may be, that with 70,000,000 people we have half a million tubs one year and the next year we will be short. That is our condition, and the Englishman will not take butter from any country which can not give him a steady supply.

Q. It takes time to establish a reputation?—A. Yes, sir.

Q. What is this butter which is spoken of as new-process butter?—A. That is butter that is made from what we call farmer's butter; the kind of butter we used to eat eight or ten years ago, that is brought into the country stores and shipped into the city, and is taken from there to factories and melted down, salted, water precipitated, and rechurned in an emulsion of skimmed milk, so as to put back in it—resalted and possibly recolored, if it needs it—to put back in it parts which are taken out. That is to say, they take out the brine, the casein, and other matter which may have become tainted or stale, and replace them. When the butter fat is melted it becomes the same as any other oil. The flavor of the butter is in the casein and not the fats. The flavor is replaced by this casein in the churn the same as oleomargarine is churned, to put the casein in, that which gives it the butter flavor.

Senator HARRIS. There is nothing else used in the process except what you have described?

Answer. It is not necessary to put anything else in the process. No chemicals at all. No more need of using a preservative or anything of that kind of butter than in any other product. The keeping qualities are about the same. That is my observation so far as I have been able to learn. Now, the different makers of process butter all have different systems. It is a comparatively new idea, developed within the last five years, and every maker works in the dark, according to his own method, and he does not let any other man know what his methods are; but I have had a number of samples of this process butter analyzed, and it has, so far as the component parts are concerned or been analyzed, been called pure butter; but of course there is a manner of detecting it, from the fact that the fats are remulsified, and it shows up under the microscope, so that it is very readily detected so far as that is concerned.

The CHAIRMAN. The further examination of Mr. Heller will be in private. The committee would like to have Professor Mitchell present.

Mr. HELLER. Does he live in the city?

The CHAIRMAN. No.

Mr. HELLER. Where is he from?

The CHAIRMAN. He is from Wisconsin. He is subpoenaed as an expert. He is employed by no one except the Government.

Mr. HELLER. He will not mention the things that I speak about?

The CHAIRMAN. I will stand responsible that he will not make any use of your trade secrets.

(All the representatives of the press and spectators were at this point excluded from the room, and the following proceedings were had in the presence only of the members of the committee, Chief Chemist Wiley, Professor Mitchell, the witness, and the stenographer.)

STATEMENT OF ALBERT HELLER—Recalled.

ALBERT HELLER resumed the stand and further testified as follows:

Examination continued by the CHAIRMAN:

Q. Mr. Heller, in compliance with your request, the committee has excluded the public and the bystanders, and the record will show as present Senator Harris and myself, and Dr. Wiley, the chief analyst, and Professor Mitchell, State analyst of Wisconsin. I will say now that Professor Mitchell testified in regard to several different articles which were marked as manufactured by you. How many different articles and compounds do you manufacture as antiseptic for the purpose of preserving food products?—A. I believe there are three.

The CHAIRMAN. What are they? Name the titles they go by.

Answer. Freezine, freezem, and konservirungs-salze.

The CHAIRMAN. Well, take the first article, freezine. It is advertised for preserving milk, cream, and buttermilk, cream puffs, ice cream, etc.

Answer. It is also used for sterilizing and cleaning utensils in which milk is put, such as milk cans and milk bottles.

The CHAIRMAN. What is the substance of that?

Answer. It is a 6 per cent solution of formaldehyde.

The CHAIRMAN. You compound this yourself, do you?

Answer. We don't manufacture the formaldehyde. We simply compound it.

The CHAIRMAN. Are you a chemist by profession?

Answer. No, sir; I would not call myself that. I have studied a little, but I take care of the financial end of the business.

Q. But you are familiar with this?—A. Yes, sir.

The CHAIRMAN. It is a 6 per cent solution of formaldehyde?

Answer. Yes, sir.

The CHAIRMAN. And 94 per cent of water?

Answer. That is not it exactly. That is it approximately.

The CHAIRMAN. What is formaldehyde?

Answer. Chemically it is CHO_H.

The CHAIRMAN. What is it made from? What is the base of it?

Answer. It is made from burning alcohol and passing it over, I believe, heated platinum wire. I think that is one method of making it, isn't it, Doctor [addressing Professor Wiley]?

Chief Chemist WILEY. From wood alcohol.

The WITNESS. From wood alcohol?

Chief Chemist WILEY. Wood alcohol is converted easily into formaldehyde by simply extracting the hydrogen.

The CHAIRMAN. You are not a medical man?

Answer. No, sir; but I have investigated in regard to these preparations, and I have consulted with physicians and gotten their opinions, and I have read up on it, and I have some reports from scientists with me who have experimented with it.

The CHAIRMAN. You consider it, you say, as an absolutely healthy thing to put into milk?

Answer. I should say it was not only perfectly harmless, but it is positively healthful, and especially so with infants.

The CHAIRMAN. Why to infants?

Answer. Infants especially are troubled with fermentation of the stomach. Especially is that true in summer, when the milk doesn't keep long. Germs get into it during the warm weather. They seem to increase more readily then than in the winter. This milk, being fed to infants, sours on the stomach very quickly, causing them to throw it up, and they get no nutrition out of it, and they very often get cholera infantum, which seems to be a disease which is hard to cure by physicians, and I understand from the records that the loss in cases of cholera infantum is something like 70 per cent, and I claim that by the use of freezine this percentage of loss can be greatly reduced. It is being used by physicians now, and there are some here in the city experimenting with it. One is using it and another intends to experiment with it as soon as the weather gets warmer. I have a report here with me in a medical journal, by a physician who has used it on infants and uses it on himself. The object of the freezine is to control and retard the increase of bacteria in the milk. It is not used in sufficient quantity to kill the bacteria. It is simply to control and retard them.

Senator HARRIS. If there was sufficient put in to kill the bacteria, would that render it harmful?

Answer. No, sir. I know of a case here in the city where a physician gave to a patient, a woman, a 40 per cent solution to use for disinfecting—I think bandages—and I don't know what the woman was going to take—she was going to take some medicine internally and accidentally took two teaspoonfuls of the 40 per cent solution. It burned her the same as mustard would, or anything of that sort. She immediately took something to make her vomit, and by the time the doctor came the burning sensation had all gone, and there were no ill effects whatever. The following day she went down shopping, as though nothing had occurred. That was two teaspoonfuls of a 40 per cent solution.

The CHAIRMAN. Still, would it not be possible for long-continued use of it to produce an effect—

Answer. No, sir; there is such a very small quantity used that it is healthful in that proportion.

The CHAIRMAN. Where do you purchase your formaldehyde?

Answer. Excuse me, but what is the object of putting that in?

The CHAIRMAN. Well, I want to know where it is made.

Answer. It is imported. It is not made in this country.

The CHAIRMAN. I don't care to know the particular place you buy it from.

Answer. Oh, I didn't understand you.

The CHAIRMAN. All I want to get at is where it is made.

Answer. It isn't made in this country at all that I know of. I am pretty sure it isn't. I think it is all imported.

The CHAIRMAN. That which you buy is imported?

Answer. Yes, sir.

Senator HARRIS. What is its general use? What is it made for?

Answer. Well, I can't answer what it is made for, but it is used for a good many purposes.

The CHAIRMAN. Is it used generally as a disinfectant or an anti-septic?

Answer. Yes; it is used as a disinfectant. It is used for keeping botanical specimens, isn't it, Doctor, sometimes? [Addressing Dr. Wiley.]

Dr. WILEY. Yes.

The CHAIRMAN. For preserving botanical specimens?

Dr. WILEY. For preserving fruits and vegetables for exhibition in jars—in formaldehyde instead of water.

Professor MITCHELL. It does not affect their natural colors so much as alcohol.

The WITNESS. It can be used in beer in the proportion of 1 to 50,000.

The CHAIRMAN. What?

Answer. In the proportion of 1 to 50,000. That, I suppose, would be hardly a trace.

Senator HARRIS. You say it can be used in beer?

Answer. Yes, sir. I can't say that it is used in beer, however.

Senator HARRIS. Why do you use the word "can?"

Answer. It is recommended for that by chemists.

Senator HARRIS. It would have a beneficial effect in retarding fermentation?

Answer. That is the object of it; yes, sir. In fact, I presume that both the doctors here know that there is a preservative used in beer.

The CHAIRMAN. Yes; we have heard of it. That is some other acid.

Professor MITCHELL. Salicylic acid used to be used. This is a new compound, and has lately come into a great deal of prominence—this particular one.

The WITNESS. If you will permit me to, I wish to state this: It is a well-known fact that germs thrive very readily in milk. It seems that milk with a small quantity of germs taken into the stomach does not have the effect that it does when it is old and has a great many germs in it. If these germs can be retarded—if the growth of the germs can be retarded and controlled to any extent—it improves the milk and makes it more healthful.

Senator HARRIS. How long have you been manufacturing this preparation?

Answer. This is the third year.

Senator HARRIS. Have you watched any experiments made? You say that some physicians have made experiments.

Answer. Yes, sir; I have some reports here, if you care to see them.

Senator HARRIS. Yes; I would be glad to hear what the opinion of physicians is.

Answer. I have quite a few reports here, not alone concerning formaldehyde, but concerning boracic acid [producing same]. I can verify my statements. I can bring in a physician who has used it internally and prescribes it in milk for infants, and he has even recommended it to one of his colleagues, and he knows absolutely that the use of formaldehyde is—

Senator HARRIS. Is this his report [indicating]?

Answer. No, sir; this is the report of another physician [handing the same to the Senator]. I had better read it.

The CHAIRMAN. You can leave it with the stenographer, so he can copy it in.

(The report referred to is in the words and figures following:)

The WITNESS. The quantity the doctor has taken is probably fifteen to twenty times as much as we prescribe.

Senator HARRIS. Mr. Heller, if this is a valuable thing, and healthy, and without any injurious effect used in the way you recommend it, why should it be concealed in any way?

Answer. I don't think it should. I think it ought to be recommended, and I think that physicians should use it.

Senator HARRIS. In your circulars with reference to it—

Answer. Oh, I see what you mean. Why, there are some States which have laws prohibiting the use of preservatives. I presume they mean powders. I don't know what they mean. I don't know whether powders come under the head of adulterants, but they prohibit the use of adulterants. Now, this, in a sense, can not be called an adulterant, because there is so little in it, and it being in a gaseous form it is supposed to evaporate.

Senator HARRIS. Neither increasing the weight nor the bulk nor the quantity?

Answer. There is half a teaspoonful used, of the 6 per cent solution, in 10 gallons of milk, and that quantity is so small that it is practically nothing.

Senator HARRIS. Has it been used for confectioneries to any extent?

Answer. No, sir; very little.

Senator HARRIS. I see you recommend it for ice cream and for cream puffs.

Answer. Yes; but that is really only lately that we have recommended it for that.

Senator HARRIS. You don't know of its being used, in fact?

Answer. Oh, there may be a very few. I don't know. There may be a few who use it, but none that I know of that are using it.

Senator HARRIS. The quantity you prescribe is greater in these cases than simply in milk?

Answer. Yes; but even so, it is a very small proportion and far smaller than the amount the doctor took there for a week, a great deal smaller. This is a 6 per cent solution, while that which the doctor took was 40 per cent—seven times as strong.

Senator HARRIS. There is a great difference in the use of a thing as a food which, perhaps, is of daily use and long-continued use and the use of a thing in larger quantity as a medicine for a short time?

Answer. Very true; but suppose it were used with cream puffs. A man doesn't eat cream puffs every day in the week. He will eat them two or three times a month, and in that quantity there is so small a quantity of formaldehyde that there is almost none. Therefore, that small quantity would, if anything, be beneficial. Now, I certainly would prefer to drink milk that is sweet, that has formaldehyde in it in the proportion which we prescribe, and know that I am drinking wholesome milk, than to take milk which is stale and full of germs, and may contain disease germs at that. It may contain germs which give off the poison called tyrotoxicon, and also ptomaine germs. Now, milk that is pure and free from germs, or which may contain only a small amount, not enough to affect the milk, is certainly more healthful than milk which is filled with germs and which is stale and on the verge of putrefaction. It may look and taste all right, but still it may have very many germs in it.

Senator HARRIS. A thing may be bad and yet something worse may be found?

Answer. I don't know what you mean.

Senator HARRIS. I say this may be bad and yet something worse may be found in the actual process of decay in articles of food?

Answer. Yes, sir. I don't consider it bad, though. I consider it a good thing.

The CHAIRMAN. A drink of this would be really dangerous if anyone should prescribe it by accident?

Answer. I cited a case where a woman took 2 teaspoonfuls of a 40 per cent solution and there was no ill effect. The following day she went downtown shopping. It occurred right here in the city.

The CHAIRMAN. You would not recommend it for a drink, of course?

Answer. We don't recommend it for that. Take the preparation that is often used for killing rats, strychnine. I have taken a lot of it as a tonic. I would not recommend anybody to eat 2 teaspoonfuls of pure mustard, either. It is a food product, however.

The CHAIRMAN. What is this next one [referring to another exhibit on the table]? Is this yours?

Answer. No, sir.

The CHAIRMAN. What is the other one? Freezem?

Answer. Yes, sir.

The CHAIRMAN. Is that the same practically?

Answer. No, sir.

The CHAIRMAN. It is not the same?

Answer. No, sir.

The CHAIRMAN. What is the basis of that?

Answer. Wouldn't you rather finish this first [referring to freezine]?

The CHAIRMAN. Yes. I hadn't anything further to ask about this at present. If you have any points you want to cover, we would be glad to hear from you.

The WITNESS. I wish to say that if mothers who have babies would all of them use freezine in the milk they feed the babies, the babies would not have sour stomachs and wouldn't throw up the milk, and would be healthier, and there would be very little cholera infantum.

Senator HARRIS. One further question in regard to this freezine. That is, of course, for milkmen and dairymen, and all those people. That is its principal use, is it not?

Answer. Yes.

Senator HARRIS. You have been manufacturing it for three years?

Answer. No, not for three years. We began in the fall three years ago, but too late to do anything. Practically, last year is about all we have done.

Senator HARRIS. Has it gone into considerable use?

Answer. There is not much used. There is some of it exported.

Senator HARRIS. It has not been generally adopted or taken up by creamery men?

Answer. No, sir. It is used to some extent, but not generally.

Senator HARRIS. You don't know whether it has become popular in that time or not?

Answer. No, sir.

The CHAIRMAN. Judging from the amount you sell, what would you say?

Answer. Judging from the amount we sell, the percentage of milkmen who are using it is almost nothing.

Senator HARRIS. In what directions have you shipped, mostly?

Answer. You mean in foreign countries?

Senator HARRIS. No; here in our own country. Where do you find your principal trade, so far, for it?

Answer. Well, I suppose in the East, because we advertise it more there.

Senator HARRIS. I simply wanted to get something which would give us the points we are after—where we could ascertain from the people who have used it what they have observed as to its effects.

Answer. I think there is almost none used in this city. If there is any used here, it is a very small quantity. It is used in the East.

Senator HARRIS. In New York State?

Answer. Yes.

Senator HARRIS. And by dairymen?

Answer. Yes, sir.

Senator HARRIS. And by the creamery men who make butter, is it used at all?

Answer. No. We have recommended it for that lately, but it has not been used for that.

Senator HARRIS. Do you think it would have a beneficial effect in increasing the keeping qualities of butter?

Answer. Yes, sir; it would. I don't think it has been used for that at all. Boracic acid is used for that.

The CHAIRMAN (addressing Professor Wiley). Do you wish to ask any questions, Professor Wiley?

Chief Chemist WILEY. I don't think so.

The WITNESS. There are some things that I wish to speak of. I can't recall them all just now, but there is one that I think of now that I wish to speak about. Milk bottles are left at a house and from there often taken into a sick room and left there, where there may be scarlet fever or some other disease, and, as I said before, the germs thrive very readily in milk, and these disease germs get onto and into the bottles. They are taken back by the milkman and washed with warm water, and the germs still remain there. The bottles are filled up again and taken to the next house, and there is great danger of infection in that manner. If freezine is used in the washing water it will prevent this. Of course it will have to be used in a great deal stronger proportion than we prescribe it for milk, and for that purpose it would also be an excellent preparation and ought to be recommended.

Senator HARRIS. That is, definitely as an antiseptic?

Answer. Yes, sir; in stronger proportions.

The CHAIRMAN. There are many antiseptics which would perform the same service?

Answer. Not any that I know of. Carbolic acid could not be used owing to its taste. Corrosive sublimate would be poisonous. The statements that I made I can substantiate by practicing physicians who are well known here, whom I have spoken with, and whose opinion I have got, and I claim, in the proportion in which we prescribe freezine, it is absolutely healthful, and if used universally it would be a good thing.

Senator HARRIS. Has it ever been, in such cases and for such purposes as that, brought to the attention of the health officers of this or any other State?

Answer. No; not directly to them; no, sir. We advertise it, though, right in that book there [indicating].

Senator HARRIS. You don't know whether they would approve of it or not?

Answer. Well, no, sir, I don't; but I should think they would, because

they can readily understand that the statement I make is true—that it has such an effect.

The CHAIRMAN. There is that freezem. What is that made of?

Answer. Do you wish the composition of all the preparations?

The CHAIRMAN. Yes, sir. If you don't want to give them, though, I shall not make any effort to compel you, as far as I am at present advised.

Answer. I will tell you in regard to freezem; I don't know as I care to give it. Just wait a minute. You need not put that down [addressing the stenographer].

The CHAIRMAN. Take time to think it over. You can consult your counsel.

Answer. I haven't taken any counsel on anything here. I simply came up here to tell you this of my own accord.

The CHAIRMAN. I have no doubt in the world that you could be compelled to answer questions. I don't want you to think we have any feeling of doubt about that—that we don't believe we have the power; but there is no disposition to use that power in compelling you to answer.

Answer. I don't want to hold anything back from you at all, but I don't want to give anything out in public that is going to injure our business.

The CHAIRMAN. We appreciate that. If your business is legitimate it shall not be injured by anything we say or do.

The WITNESS. I certainly consider it legitimate, because the preparations we use are used in medicines and are healthful.

The CHAIRMAN. I have no doubt you consider them so. The question is whether it is so or not.

The WITNESS. I take that from statistics and reports which I have.

The CHAIRMAN. The final determination of the question, so far as the committee is concerned, will be left with the Senate to decide.

The WITNESS. I think scientists ought to be consulted and experiments made to find out which preservatives are harmful and which are not.

The CHAIRMAN. That is what we are doing here now.

The WITNESS. And those that are harmless ought to be used. They are a good thing, and I will tell you which we use, but I wouldn't like to designate exactly what preparations they are, because, as I understand, this report will be published in time, and if you permit the use of some of these preparations it might in time injure us.

The CHAIRMAN. If we what?

Answer. If you permit the use of some of these chemicals which we use, why it would injure us later on, if I were to state what these chemicals are used for—that is, in what preparations certain chemicals are found. For instance, if I say that freezem is a certain preparation, and you permit the use of it, then, later on, if anybody wants to know what freezem is, he can look it up.

Senator HARRIS. You have no objection to stating what the principal ingredient is.

Answer. Yes; I would. But I will tell you what I would like to do is to speak about the chemicals which we use for preservatives and not mention any preparations they are used in.

Chief Chemist WILEY. I would suggest that there will be no trouble, in case the committee wanted to know that, to submit it to a chemist for examination.

The WITNESS. Certainly. As far as you are concerned—I don't want this to go into my statement—

Professor MITCHELL. I testified the other day that the principal ingredient was sodium sulphite. You didn't hear that testimony; so I thought I might ease your mind on that one point.

The WITNESS. I don't care to have that come from me. You can say it, if you desire. Now, talking about sodium sulphite; it is used in medicine to cure sores in the mouth—canker sores—and it is also given for fermentation of the stomach three times a day, in quantities of approximately 4 grams for each dose, or about 60 grains three times per day.

Chief Chemist WILEY. It is a salt of sodium. It is sulphurous acid, common sodium with sulphurous acid—that is, the fumes of burning sulphur.

The WITNESS. In the preparation in which we prescribe it it is 2 ounces to 100 pounds of meat, which is $8\frac{3}{4}$ grains to 1 pound of meat. A man with a very hearty appetite could not eat more than half a pound of meat, and in that he would get 4 grains, while it is prescribed by physicians to be taken three times a day, 60 grains each time. Now, this is used in really only one kind of meat, and that is chopped beef and hamburger steak. I don't think that a man eats hamburger steak more than two or three times a month. Now, a man eating hamburger steak three times a month, even though he should eat half a pound at a time—he wouldn't eat more than a quarter of a pound at a time—he would get 2 grains each time, which, for a month, would make 6 grains. The dose by physicians is 60 grains three times a day. The object of using a preservative in chopped beef—

The CHAIRMAN. You don't care to say whether that is in it or not?

Answer. No.

The CHAIRMAN. But it is in the powdered form?

Answer. Yes, sir; it is a powder. The object of using sodium sulphite in chopped beef is to preserve it, to give it a nice color, and it will keep longer than if it did not have anything on. If it didn't have anything on it would spoil over night.

Senator HARRIS. Well, can you take meats which are partially spoiled—

Answer. No, sir.

Senator HARRIS (continuing). And correct them in any way?

Answer. No, sir; anything that is spoiled is spoiled, and you can't correct it—any meats.

Senator HARRIS. I mean it can not be used as a disguise or anything of that kind?

Answer. No, sir; it is simply to keep fresh meat fresh. If hamburger steak is allowed to remain on the counter and it has not sodium sulphite in it, it will become tainted, it will get sour, and it will decay in a very short time. Germs get on it and it begins to turn dark in two hours. Now, if a preservative is used, the ptomaine germs and other poisonous germs can be prevented, because the meat will not decay. Ptomaine germs seem to thrive in decayed meat. I would prefer to eat meat with a small proportion of sodium sulphite in it—meat that is fresh—than to eat meat which has none in it, meat that is stale or that has disease or poison germs in it; and I contend that a very small proportion of preservative in hamburger steak is absolutely healthful. I admit that there are preservatives which are dangerous to health. Salicylic acid is one of them. We never use that.

Senator HARRIS. You don't use that at all?

Answer. We don't use it at all; not a grain of it.

Senator HARRIS. Do you use boric acid?

Answer. Yes, sir, we do; and I have many reports here from scientists and chemists and physicians on it, and I would like to go into that in detail, unless there are any questions you wish to ask me in regard to the sodium sulphite.

Dr. WILEY. I am very well acquainted with those preservatives.

The WITNESS. I would like to make a statement that there has been much agitation in the papers in regard to the embalmed-meat question. I wish to say that every one of us eats embalmed meat—and we know it and like it and continue to like it—and that is, hams and bacon. That is actually embalmed meat. Chemicals are used for curing the meats. Some use only salt and saltpeter. Some use boric acid and salt. The boracic acid is positively more healthy than saltpeter. Saltpeter has a direct effect on the kidneys, which, in some cases, is not beneficial. I don't know how long saltpeter has been used. Saltpeter has been used for curing meats, and boracic acid is often used in connection with it. I have been in the packing business, and we used salt and saltpeter, and sometimes boracic acid, for curing. All dry salt meat purchased by the English is required to be rubbed with borax or boracic acid. They will not buy it any other way. They allow the use of boracic acid to a certain degree, in certain proportions, and contend that it is not at all harmful when used in the proper proportions; in fact, that it is beneficial. And for that reason it is my opinion that boracic acid ought to be allowed to be used in certain quantities. There are many food products which require a preservative. They could not be put on the market without it.

Senator HARRIS. Refrigeration proves the point which you make, that a great many food products require some artificial preservative, if we can call refrigeration artificial.

Answer. You mean that, owing to the very fact that they have to use refrigeration for preserving meats?

Senator HARRIS. It shows that there is a necessity for preserving meat. That is evidenced by refrigeration.

Answer. That there is preservation required.

Senator HARRIS. You go on the theory that refrigeration is not sufficient; that something more than that is needed?

Answer. Yes; I will explain that. Refrigeration is used for fresh meats only. I am talking of cured meats. However, in order to cure meats it is necessary to have the temperature down during the progress of the curing. After that the temperature may be raised to 50°, if necessary. In order to cure meats to keep, such as ham and bacon, it is absolutely necessary to use preservatives. Salt is a preservative, and so is saltpeter. One of the great objects in using boracic acid is that a mild-cured ham can be turned out; a better cured one, with a finer flavor; the brine doesn't have to be so strong as it need to be without boracic acid. I answered, back there [referring to his testimony]—I would like to go back. There is something I would like to say. I can't remember what it was.

(The stenographer read the last page or two of the testimony of the witness, and at the conclusion of the lengthy answer just preceding the questions by Senator Harris regarding refrigeration, the witness stated he desired to insert as follows:)

The WITNESS. As it is necessary to use preservatives in many foods, I think that certain chemicals, if found to be harmless, should be per-

mitted to be used. In fact, it is necessary. In other words, certain food products can not be put upon the market, and it will affect to a great extent nearly all of the manufacturers of food products. If you would like to, I can leave these papers with the stenographer and he can put these in his records. They are reports from chemists, physicians, and scientists. I think it would be well to put them in.

The CHAIRMAN. That is all right. You may leave them.

(The articles and reports referred to are attached to the testimony of this witness.)

Senator HARRIS. There is one question I would like to ask you, as you spoke of having been a packer of meats and so on. These modern processes which consist in the introduction of other things than salt and saltpeter, are they not more desirable on account of the hastening of the curing of the meat than because it is better cured?

Answer. Well, I will tell you. In advertising our goods we say so, but it takes just as long. The only thing is you can turn out a milder-cured ham. Without it it would be necessary to use a very strong salted brine, and the meat would be dry and hard and salty and have a very poor flavor. The salt really burns the meat. That is the expression used by packers.

Senator HARRIS. In the so-called smoking of meats that in the old-fashioned way required a very considerable time of the actual application of smoke. That is done away with by the modern packers, is it not?

Answer. No, sir; meats are smoked to-day the same as they always were, and the object is simply to give them a flavor and color, and not to cure them.

Senator HARRIS. I thought that was given by washes of certain substances—creosote and some others.

Answer. That is done with pyroligneous acid, which is the same thing as smoke. It is condensed smoke. Isn't it the same thing, Doctor [addressing Dr. Wiley]?

Chief Chemist WILEY. It is the distillation of smoke.

The WITNESS. It is the same as smoke. I don't consider it a bit more harmful than the smoke. I don't consider it harmful at all.

Senator HARRIS. I don't say that it is harmful, but whether it penetrates as thoroughly. Of course, it requires less time.

Professor MITCHELL. Would you care to tell the committee in reference to the use of coloring matter?

The WITNESS. Yes; I will come to that.

The CHAIRMAN. What coloring matter do you use?

Answer. I would like to make a statement about the rosoline. I would like to have it omitted from the record, however, and if you will leave it out I will tell you what that statement is.

(The witness made his statement verbally, which was, at the request of the chairman of the committee, not taken down stenographically by the reporter.)

The WITNESS (continuing). The color used for sausage, for bologna and weiner sausage, is aniline dye. There are different kinds of aniline dyes. Some of these are a poison. Some are poisonous, because they are made with the arsenic process, and some are perfectly harmless. They are not made with the arsenic process, and the colors themselves are not injurious. They have no injurious effects upon the human system any more than some other coal-tar products, such as saccharine and vanalin. The aniline dye which is used by us is guaranteed by the manufacturers as perfectly harmless. Aniline dyes are used in a good many food products.

Senator HARRIS. Where is this special aniline dye manufactured, Mr. Heller?

Answer. I think it is made in Germany.

Senator HARRIS. It is imported?

Answer. Yes, sir. And I contend that aniline dyes made—what is the process [addressing Dr. Wiley]—the niter process?

Chief Chemist WILEY. Aniline dyes are made by combinations of various shapes, in various manners. The salts of aniline make different colors.

The WITNESS. Yes; but there is what is called the arsenic process—

Professor MITCHELL. The better grades of colors, which are guaranteed as free from arsenic, generally are not made by that process.

Chief Chemist WILEY. The arsenic formerly in this was due to the sulphuric acid, which contained traces of arsenic.

The WITNESS. The arsenic has been eliminated now, and as certain aniline dyes are harmless, there is no reason why the use of them should be prohibited. They make food products look more appetizing. I think that should be done. We like to eat things that look nice. I don't think, though, that food should be adulterated with harmful preparations, but I believe that harmless preparations should be allowed to be used, in order to cheapen food products in certain cases.

The CHAIRMAN. Don't you think that they ought to be marked, so that people will know if they are adulterated?

Answer. If they are marked, the poorer classes will be afraid to use the goods, or they might be backward in buying them, while they can't afford to buy the higher grade of the pure goods and pay the price.

The CHAIRMAN. You think it would be hard—the sale of salt, for instance—if it was marked adulterated salt?

Answer. Certainly it would.

The CHAIRMAN. Would you call this adulterated salt or adulterated aniline dyes?

Answer. I would call it a color.

The CHAIRMAN. There is something in there besides color, is there not?

Answer. When we get the colors, they have salt in them. They are cut down with salt.

The CHAIRMAN. I don't care to go into your code of ethics. You think that if I made glucose I ought not to be allowed to sell it as honey, had I?

Answer. No, sir. I think that it is perfectly right if I should go into a store and say, "Have you any honey?" and they say, "Yes." "What is the price?" "We have some at 50 cents a pound, and we have some at 20 cents a pound."

The CHAIRMAN. You think the merchant is perfectly honest who tells you it is honey and sells you glucose at 10 cents a pound?

Answer. He would sell me glucose alone. There would be no honey in it; and I know that if I want pure honey, I can get it by paying the price; and I think that if any law is passed to mark all food products, it will affect the industries—the manufacturing industries—of food products very much indeed and do great damage to this country, and I think that the agitation now in food products will hurt our exports.

The CHAIRMAN. The history of the country is just exactly the opposite of what you say.

Answer. I will give you my reasons for that.

The CHAIRMAN. Of course if people would sell red salt for something different from what it was, it might hurt the sale of red salt; but when we began inspecting butter and flour and filled cheese our exports immediately increased, because we have before this committee communications from the heaviest exporters saying that the moment the Government took an interest in flour the exports increased nearly 50 per cent last year. Mr. Eckart so stated.

The WITNESS. That may have been from some other cause. I think that when we agitate this food question it affects so many of the manufacturers—in fact, nearly all of them—that it is going to do an injury, because the foreign governments will believe that our foods are to a great extent adulterated, and they won't want to buy them.

Senator HARRIS. Foreign governments have actually insisted upon governmental inspection.

The WITNESS. But right in the face of governmental inspection in the packing houses, and right in the face of the fact that the investigating committee reported that there were no chemicals used on the fresh or canned meats, Germany is right now trying to pass a bill to prohibit our meats from being imported.

The CHAIRMAN. They have been trying to do that for years. That is simply to help themselves.

The WITNESS. Now that they know that the reports are not true, and know that our meats are being inspected by Government inspectors, they still won't allow them in.

The CHAIRMAN. That is for their own protection.

Senator HARRIS. This action on the part of Germany was prior to the finding of the board, so far as that goes, was made. We have not gotten that report ourselves, in full, yet—the public hasn't. I have no doubt they took advantage of some of the charges which were made. But Germany has been specially insistent upon governmental inspection in regard to trichinosis and various things.

The WITNESS. I have read that since then they have kept it up; and I wish to call attention to Secretary Wilson's remarks, that the agitation in regard to meat will in time cost this country more than the war with Spain, owing to the injury done to the meat industry; and I know from my own knowledge that one of the largest plants in this country runs only three days in the week now, and that one of their salesmen who has traveled over his territory sold only 7 gross of cans, while heretofore on the same trip he always sold a carload; and it only goes to show that this agitation injures the manufactures and industries of this country.

Senator HARRIS. Is your deduction from that that the Government should simply keep hands off and take no interest in these matters?

Answer. No, sir. I say that deleterious substances should not be allowed; that they should investigate, and those they find are all right should be allowed; but they should not say that no preservatives can be used, because the manufacturers would simply have to quit business.

Senator HARRIS. The Government has not said that, nor does it contemplate it. It is only on harmful things. The general trend and purpose, as expressed by everybody, has been to simply eliminate that which is harmful.

The WITNESS. Yes; but it is a fact that a good many men who have not made it a study deep enough give opinions which are sometimes accepted, and therefore do harm.

The CHAIRMAN. It is the lying about our meat that has hurt it.

The WITNESS. The newspapers have made so much about it, and the reporters showed up all kinds of stuff that they didn't know anything about.

The CHAIRMAN. Anything further that you want to say, Mr. Mitchell?

Professor MITCHELL. I wanted to say to Mr. Heller that part of our criticism of the use of such compounds as freezem is this: That the butchers are in the habit of keeping a package of that there. It is recommended for that purpose, and they do it in the butcher shops. I have seen it myself frequently; and when the butchers sell a cut of meat they trim the meat. Portions of good, clean, fresh meat are cast into a barrel, and those odds and ends go to make up this hamburger steak; and then these are preserved, as a rule, where they follow out the directions on the package, by sprinkling this salt upon them, and then when sufficient of these odds and ends accumulate—they are all clean and nice, cut from meat that is sold—when sufficient of that is procured it is ground up into steak.

The WITNESS. Have you seen that done?

Professor MITCHELL. Yes; I have seen that done in Milwaukee. The point I make is that otherwise these men would have had to take these scraps and keep them in the ice box to keep them fresh, and after they have kept them a much shorter period of time they would have had to work up a small batch of them into hamburger steaks, rather than wait until they got plenty of it.

The WITNESS. I don't want that to go in there.

Professor MITCHELL. I meant it as a statement of the abuses which follow from the use of these things.

The WITNESS. I will tell you why I would not like to have that go into the record. If a butcher does wrong, that isn't my fault.

Professor MITCHELL. I don't mean to have that as a part of your record.

The WITNESS. Could I have that eliminated? Of course, I have never seen that done, and the butcher isn't supposed to do it. He is to blame. He should use nothing but fresh meats.

Professor MITCHELL. Is it necessary to use any preservative in fresh meats?

Answer. Yes, sir. As I explained in regard to hamburger steak. I explained that it begins to turn dark within two hours, which is just because of the germs from the air.

Senator HARRIS. It is fresh meat.

Answer. No, sir; it isn't fresh meat when it begins to turn stale.

Professor MITCHELL. I said it would prevent it from turning stale if this salt was sprinkled upon it.

The WITNESS. I understood you to say the meat was stale when they trimmed it off.

Professor MITCHELL. Oh, no. I said that these trimmings are often placed aside. They are kept until plenty accumulates.

The WITNESS. In regard to that, they can accumulate for an hour, or for a day, or a day and a half. Packers use only trimmings in sausage, as far as that is concerned.

Professor MITCHELL. That was the only point.

The WITNESS. I would not like to have in there right after my testimony—can I have that eliminated?

The CHAIRMAN. That has nothing to do with your evidence.

The WITNESS. I wish to state, then, that the butcher is to blame for that, and I don't think that the butcher allows his meat to accumulate

more than probably half a day when he uses it up; and if he uses a little freezem according to the quantity prescribed, why the meat is all right. It won't hurt it at all if it is kept in a box for half a day, if necessary, or even more; but he wouldn't let it lie outside all night.

Professor MITCHELL. The compound used in the specific instance which I had in my mind was not freezem, but it was a certain chemical sold by another manufacturer.

Chief Chemist WILEY. I want to make a statement to the committee in regard to the testimony, and that is this: If you will remember, when I was on the stand I testified that I believed in innocent preservatives; that there were certain food products in which they were necessary, and that I believed that in a proper use and way they were not injurious to health; but what I want to say here is to call attention to what I said there, and that is this: That each preservative should be used under its proper name. If Mr. Heller will excuse me for this, because it is simply my record and not his, the trouble with these is the fraud upon the public by using a cheap substance, a very cheap substance, under a name that the people don't know, and selling it for an immense profit.

The WITNESS. I would like to answer in regard to that.

Chief Chemist WILEY. That is what I brought out in my first testimony.

The CHAIRMAN. That is what you said before. You said you would not oppose the use of preservatives.

Chief Chemist WILEY. On the contrary, I should favor the use of preservatives—and this is an excellent preservative for certain purposes, and, as explained by Mr. Heller, I don't see how, in the small quantity which he recommends, it could be injurious to health; and doubtless it is a good remedy. In certain diseased conditions it may prove beneficial. I don't want to combat that testimony at all. What I say is that even a remedy should not be used under a name in which it is not known. It should have its proper name and be properly understood by everybody using it.

Senator HARRIS. Take, for example, this statement: "Freezine is a liquid gas made from vegetable materials, and is used as a substitute for ice."

Chief Chemist WILEY. It is liquid when it is liquid, and it is a gas when it is a gas. This is a solution of a gas in water, the same as any other gas. A liquid is a liquid.

The WITNESS. I considered using that word, but, as the words "liquid air" were used, I thought it would be all right to use it.

Professor MITCHELL. One of the claims made on this label is that it evades detection. That was the point I wanted to bring out. Would that, in your opinion, be an advantage?

Answer. No, I do not consider that an advantage. Yes, to a certain extent it is.

Senator HARRIS. Did you mean that the quantity would be inappreciable?

Answer. Yes, sir. It goes to show that the quantity is so small that it is hardly even a trace—can't be found.

The CHAIRMAN. In other words, you need not be afraid to use it, because they can not detect it.

The WITNESS. What I meant to convey is that it goes to show what a very small quantity is used.

The CHAIRMAN. If you wish to come before the committee again at any time, you are welcome to do so. So far as these documents are concerned, for the use of the newspapers, they will not be used. No

one here present will give away any of the information you have stated to us about your business. It goes into the record, however.

The WITNESS. I have also spoken in general, not alone of our business. I have spoken of preservatives which we don't use.

The CHAIRMAN. I understand, but you have stated your evidence just as it is; and, just as Senator Harris stated, it will not be used or given to the public only as it becomes a part of the record in this case before the Senate. It may be printed if the Senate orders it printed, and it may be used as the basis of a report when we take up this whole subject. You are not the only one engaged in manufacturing antiseptics.

The WITNESS. There are very many in it; very many in the business.

The CHAIRMAN. And we started out to get all the information that we could without injuring anybody else's legitimate business.

The WITNESS. I heard some remarks in regard to pickles. I should certainly advise that such methods be stopped, if they use sulphate of copper and keep it in copper kettles, etc.

The CHAIRMAN. The Senate asked us to inquire what food adulterants were deleterious to health and what adulterants were merely frauds.

The WITNESS. In case there should be anything that I care to report, would it be all right for me to write it and send it to you?

The CHAIRMAN. Yes.

The WITNESS. I may think of something else later.

There is one thing I wish to put in, and that is the statement that the State of Ohio allows the use of formaldehyde in milk. I have a letter to that effect—not from the commissioner, but from a dealer who spoke to the commissioner, and the commissioner said—

Senator HARRIS. It was reported to you in that way.

Answer. Yes. Do you care to see the letter?

Senator HARRIS. You may give it to the stenographer.

(The letter in question is hereto attached, marked "Exhibit A.")

EXHIBIT A.

[Copy of letter on letter head of "The Athens Exile, Jersey Herd."]

ATHENS, OHIO, June 4, 1898.

GENTLEMEN: Please favor me with a sample of "Freezine," or advise me positively if there is any salicylic acid in it.

If the preserving property is formaldehyde, our dairy and food commissioner can see no objection to its use, but salicylic acid is a violation of our food laws, he claims.

Yours, truly,

E. G. SILVUS.

Messrs. BURNAP & BURNAP,
Toledo.

EXHIBIT B TO TESTIMONY OF A. HELLER.

In the October issue of The Bulletin of Pharmacy, Vol. XI, No. 10, on page 439, appears the following:

"FORMALDEHYDE AS A PRESERVATIVE OF MILK.

"Prof. J. N. Hurty does not share the misgivings which have been expressed lest the use of this antiseptic provoke dyspepsia. He states (*American Druggist*): 'For a child affected with marked indigestion, obviously due to fermentation, I recently recommended that cow's milk be treated immediately after being taken from the animal with 5 drops of 40 per cent solution of formaldehyde to each quart

and that the child be fed with the milk thus treated. Two weeks' trial of pasteurized milk had not brought relief. Within ten days after commencing the use of the formal-milk a decided improvement was apparent. Its continuation resulted in complete cessation of the symptoms. Now, after a ten weeks' trial, with two intermissions, which admonished a return to formal-milk, the child is in excellent condition. Upon the principle that it is best to do without all substances of this character when not actually needed, the formal has been discontinued, and the strength gained while using it has so far (six days) sufficed to contend against the influences which were before prominent. The most careful examination fails to discover that any stomach or bowel lesion exists. If a "lifelong dyspepsia" should very soon begin, it would not be entirely unfair to conclude that the formaldehyde was caustic to a considerable degree, although acute indigestion undoubtedly existed prior to its exhibition.

"FORMALDEHYDE IN ACID INDIGESTION."

"Being cursed myself occasionally with acid indigestion, I have used formaldehyde as a preventive of the fermentation which causes the acidity with most excellent results. Whenever the acid condition develops I immediately abandon all foods except milk, and this I take, drinking it slowly, after adding to each 8 ounces 10 drops of 40 per cent solution of formaldehyde. The results have been excellent; and although I have taken the agent in this way many times during the last year and a half, only the most desirable effects have been observed. For one week, as experiment, I took three times a day, after meals, 4 ounces of milk containing 5 drops of 40 per cent formaldehyde solution. Not the least untoward result at the time or since has been noted."

In an issue of Merck's Market Report, dated September 1, 1896, on page 459, appears the following:

"FORMALDEHYDE AS A PRESERVATIVE."

"C. N. McS.—Formaldehyde is a stable aqueous solution of formic aldehyde gas (HCOH). It is a colorless, volatile fluid, of a pungent odor, clearly miscible with water in every proportion. Besides as a food preservative (for wines, beer, jellies, preserves, etc.) formaldehyde has been recommended as a nonirritating, nontoxic surgical and general antiseptic (in wounds, abscesses, etc., for clothing, bed linen, sick chambers, etc.), and as a preservative of collyria and anatomical and botanical specimens.

"According to Dr. Berloiz (Nouv. Rem., 1892), formaldehyde is perfectly harmless to man. Dr. Rideal states that he has frequently drank a 1 per cent solution without any ill effects. In a paper read before the Society of Public Analysts, London, on May 1, 1895, Dr. Rideal further states that 1 ounce of formaldehyde solution is used in the trade to do the same work as 5 pounds of the usual boric-acid and borax mixture (75 per cent of the former and 25 per cent of the latter). In the case of milk, for instance, the quantity of formaldehyde necessary to preserve it is, according to Dr. Rideal, so small that it is absolutely impossible to detect its presence by the taste or smell, even on boiling, when the formaldehyde passes off as a gas. In liquids, such as beer, formaldehyde has to compete with sulphites; here again, the quantity necessary to effect perservation is much smaller than the equivalent weight of sulphurous acid, and it can not be detected by taste or smell, although when sulphites are used it is frequently possible to notice them in this way. According to Jablin Gommet, for preserving wine, 1 part of formaldehyde (as on the market) to 2,000,000 suffices: for beer, 1 : 1,000,000; for fruit jellies, 1 : 10,000. But from the reported innocuousness of formaldehyde, it may be inferred that these proportions can be safely exceeded, if necessary.

"Formaldehyde has a peculiar affinity for cellulose, thereby permanently retaining the latter in an antiseptic condition. After several days' contact with fruit or vegetable fiber the formaldehyde disappears as such and can no longer be detected by the methods of testing now in vogue.

"On adding formaldehyde to food products prepared by hot process a small portion of the formaldehyde gas is apt to be eliminated; but this may be prevented by taking a small quantity of the warm food product, allowing it to cool somewhat, then adding to it the required quantity of formaldehyde, and stirring the mixture into the entire batch of material to be preserved.

"Formaldehyd solution is not eligible as a preservative of products that come into contact with iron, or whose color is due to the iron they contain—e. g., raspberries and strawberries. In such cases formaldehyde produces a purplish coloration.

"It appears from the above that formaldehyde is a valuable preservative, being at once powerful, innocuous, and convenient."

MAY 11, 1899—10.45 a. m.

The committee met pursuant to adjournment.

Present, the chairman and Senator HARRIS.

STATEMENT OF HENRY G. PIFFARD.

HENRY G. PIFFARD, being first duly sworn, testified as follows

Examination by the CHAIRMAN:

Q. Will you please state your name, residence, and occupation?—A. Henry G. Piffard, M. D., New York City. I am a physician.

Q. In addition to your profession, Doctor, have you any connection with any manufacturing company or establishment?—A. Yes, sir; I am interested in the manufacture of salt.

Q. We will be glad to have you make any statement in regard to your observations or conclusions concerning the adulteration of food products.—A. As a matter of common report, and as a matter of personal knowledge, I know that many food products are adulterated very largely. The questions which have interested me more particularly, Mr. Senator, are the best means of preventing these adulterations. Of course, we are aware that there is certain legislation in the different States which more or less effectively or more or less inefficiently covers the ground. The question which I believe your committee has to consider is as to the desirability of national enactments on the subject. I suppose your committee also proposes to determine the limits of the powers of Congress in respect to it.

From what little knowledge I have of Congressional powers, the powers of Government, I do not believe that any enactments by Congress will be sufficiently comprehensive, assuming that they are constitutional, to remedy all evils; but I believe that Congress should authorize an investigation into various of the food products that are offered for sale in this country, whether manufactured in this country or imported; that other legislation, going as far as national authority will permit, should be enacted, and that, with that as a basis and as a general guide, the State legislatures could supplement the acts of Congress by effective local laws. The effectiveness, of course, will depend upon the intelligence and honesty of the legislators. A legislator may be honest, but not sufficiently intelligent to detect imperfections in a bill put in purposely by those who are opposed to the bill in a general way. The carrying out or effective carrying out of preventive measures will rest rather with the States than through any action initiated by the General Government; but the enactments of the General Government would prove a guide to the State legislatures. It seems to me that Congress should authorize a commission to determine what may be considered adulterants, whether harmful as regards the public health or as fraudulent as regards the pockets of the consumers.

Many adulterated articles are perfectly innocent as regards health, but are arrant frauds. The mixing of corn meal with wheat meal no one can complain of on sanitary grounds, but if I desire to purchase a pure wheat flour and am furnished with a mixture thereof, I am defrauded, and there should be some provision which would prevent that. I think that wherever a mixture of two wholesome substances is offered as being a pure article, it should be punished; but I would not, under any circumstances, prevent the mixing of two harmless

substances, provided the nature of the composition of them was indicated on their label or on their advertisement, or in some other way, so that the public might know what they were buying. I may say, incidentally, that as a salt manufacture I offer one brand of salt which is not pure, which is mixed, but it is mixed with cornstarch, in a small proportion, and the fact that it is mixed with cornstarch is stated on the label. So, if a man chose to buy pepper mixed with any cereal flour of any sort, he should be at liberty to do so, but the label should indicate what he is buying, and should not indicate that he is buying pure pepper. There are those who do not like to use as a condiment pure mustard. In fact, we rarely get it. So mustard mixed with a certain proportion of carbohydrate is not objectionable if it is so stated. The English people, as you are doubtless aware, have had a good deal of trouble over this question of mustard—the question whether the artificial coloring of it should be permitted. Well, it is permissible to a certain extent, and I see no objection to it so long as it is stated on the label, and I see no objection to any other food product being colored, provided the genuine ingredients are stated. If a mustard with a certain quantity of turmeric in it is more attractive to the eye, let the people have it, but let it be stated that it is a mixture of mustard and starch or turmeric, in such and such proportions. Now, a great deal of legislation which Congress, I think, should enact could be copied en bloc into State legislation, with such additional measures, especially as regards the penalties, as the several States might see fit to enact.

Those, Mr. Chairman, appear to me to be the general principles of a government inquiry of this sort.

The CHAIRMAN. Well, Doctor, what definite information can you give, from your observation and experience, as to, first, the harmful or deleterious adulterants, and, next, as to those which are simply fraudulent?

Answer. Let us take, for instance, beer. That is a question upon which a good deal of controversy might arise, but my own views on that subject are definite and decided. I believe that beer made from barley malt, with hops, with yeast, of course, as a necessary ingredient, and water, is, in the main, a wholesome drink for healthy people, and sometimes a useful drink for people who are ill; but I believe (and in that belief I feel very positive) that beer made from corn products and beer made from rice is not wholesome. The chemists will tell you that the chemical differences between the products of barley malt and products of corn and rice are insignificant, and there is no reason why corn beer should not be as wholesome as barley beer. Now, chemists have done that who are certainly as much entitled to their opinion as I am to mine, and I do not know of any reason why beer made from corn products should not be as wholesome as that made from barley products, but I do not believe it is, and I believe it is distinctly injurious as it is made.

The CHAIRMAN. You base that opinion upon the result of your observations as a physician?

Answer. As a physician and observations upon myself. I can drink a pure beer, that has been properly kept, and drink it in reasonable amount, without any immediate ill effect. If I take one of the other beers which I regard as improper beers, I feel the effect from it right away. There is one other point as regards beer. We all know that a whisky that is new is not commonly regarded as wholesome. So I believe that a beer that is new is not wholesome.

The Government already protects the consumer, in great measure, against new whisky, by allowing the whisky to remain in bond for three years, I believe, or something of that sort, without compelling the tax to be paid, so that there is an encouragement to keep whisky at least three years before it goes to the consumer. That, as far as I am aware, is not so with beer, and a great deal of the beer which is offered for sale is beer which has not been kept as long as it should be. It has not been fully matured. And I believe that a new beer, or a new ale—and when I say beer I cover all of the—

The CHAIRMAN. All of the malt liquors?

Answer. All of the malt liquors as injurious—much more so than a beer which has been sufficiently and properly matured.

The CHAIRMAN. Well, Doctor, have you any means of knowing, by investigation, anything as to the quantity of these injurious beers, what proportion they bear to the total beer consumption?

Answer. Well, I am familiar only with the beers in New York, to a limited extent with imported beers, and to a limited extent with beer brought into New York State from other States. What I give you now I will give you as my general impression from my experience. Up to within a few years, we will say five, I hardly think that a glass of what I would regard as wholesome beer could be bought in New York City brewed in the State of New York. I once, myself, several years ago, suffered very severely from improper beer, but during the past five years one brewer after another has been making and selling a beer which I believe to be wholesome. Some of these brewers—I have two in mind—make only a beer which I should regard as a proper standard beer. There are several others, however, who make a standard beer, but also make a beer—and when I say standard I mean a proper beer—[addressing the stenographer] please correct that. There are several others who make both a proper beer and an improper beer. Now, there are two difficulties in the way of pure-beer legislation in this country.

The CHAIRMAN. Excuse me. Before you enter upon that branch of the subject I wish to ask you, Are your impressions with regard to the character of beer derived from chemical analysis?

Answer. No, sir; from the physiological effects.

The CHAIRMAN. Simply from the effect of the beer upon the system?

Answer. Yes, sir; although I have made some chemical analyses in my life, and once, twenty-five or thirty years ago, I wrote a little book on chemistry. Yet I am not a professional chemist.

The CHAIRMAN. Your means of observation as to the effect upon the system would not enable you to determine whether it was a beer made from rice or from corn, would it?

Answer. No; but it is pretty well understood what beers are made from—

The CHAIRMAN. General information is what governs you in regard to these two articles?

Answer. Yes; and in some instances I have been aware, through analyses made by others, of the composition of the beers in question. I was about to state that to my mind there are two difficulties in the way of an efficient pure-beer legislation. In the first place, there was a document issued from one of the departments of the United States Government which rather favored the use of what I consider improper ingredients in beer; a document which I think wiser legislation will suppress. Secondly, the general public prefer, as a matter of taste,

the improper beer to the proper. There is a very grave difficulty encountered.

The CHAIRMAN. Still you say that certain brewers, within a few years past, have manufactured what you call a proper beer?

Answer. Yes, sir.

The CHAIRMAN. That was in response to a demand, I suppose.

Answer. Possibly it was in response to a demand. The first firm that started that did it, I believe, from higher motives than that. They made a pure beer because they were unwilling to make an improper beer, and that beer was a very fine beer, and many people like it and many people prefer it; but the great mass of the people in New York City—I don't know anything about anywhere else—will, if the choice is before them of the two classes of beer, select for their drink the improper beer, on account of the pleasantness of flavor, or for some other reason.

The CHAIRMAN. Habit, perhaps.

Answer. Habit, perhaps; they select the improper beer.

The CHAIRMAN. They become accustomed to the continued use of what you call the "improper" beer, and become habituated to its taste or flavor.

Answer. As regards the imported beers, they do not agree with me personally. There are many others with whom they do not agree. Many people have an idea that they are purer than our native beers, and drink them on that account. My own impression, though I have not made any analyses, and I am not sure as to the facts, is that they contain preservatives to a considerable extent. Perhaps Dr. Wiley knows how that is, but I know that I can not drink them.

The CHAIRMAN. You think antiseptic preparations or something of that kind are used?

Answer. Yes, sir. I do not know that from my own knowledge, but it is a matter of common repute.

The CHAIRMAN. So far as your general knowledge of the subject is concerned, the character of the beers and ales brewed and used in New York is not different from those used elsewhere?

Answer. I did not catch the question.

The CHAIRMAN. So far as your observation goes, there is no particular difference between beers used in New York and those used elsewhere?

Answer. I am very seldom elsewhere, and I have no practical knowledge of the beers that are made elsewhere. Of course I find Milwaukee beer and other beers for sale in New York, but I do not like them and do not drink them. I have drunk them, but I do not like them.

The CHAIRMAN. Is there any other article of general consumption which has attracted your attention, as above narrated, either as a mere fraud or as deleterious?

Answer. Well, there are others, but none to which I have given more than passing attention.

The CHAIRMAN. Salt, you say, is sometimes mixed with a small percentage of cornstarch?

Answer. Yes, sir; and sometimes it is so sold; and sometimes it is sold as being absolutely pure.

The CHAIRMAN. The object of that is what, Doctor?

Answer. The object of putting the cornstarch in is to make it run more freely through the cruet.

Q. It is a drier, practically?—A. It is a lubricator. It coats the

grains of salt so they slip by each other more quickly. There is not the same adhesion between them as there is in the pure salt.

The CHAIRMAN. It retards the effect of moisture?

Answer. No, I do not believe it has any effect as regards moisture; not according to my observation. I think it is simply a lubricant.

The CHAIRMAN. It makes it more desirable to use as a table salt or something of that kind?

Answer. Some people prefer it.

The CHAIRMAN. Some manufacturers state that distinctly or their packages and others do not?

Answer. Some do and others do not. Others deny any mixture of any kind.

The CHAIRMAN. Have you any knowledge as to the use of so-called antiseptic preparations, Doctor, in articles of general consumption, as preservatives?

Answer. I believe that they are very largely used. I believe that in New York State, at least, they will be used less than heretofore. I believe that the compounds of salicylic acid, boric acid, borate of sodium, ordinary borax, and formaline are the ones principally used. There is no question in my mind as to the injuriousness of borax, and at the hearing given by the senate committee of the New York State legislature in January last I expressed myself to that effect. Formaline has been offered under various names. Formaline is the trade name only. Formic aldehyde, which has been offered under various trade names as a preservative, is an active irritant poison. Of course, if it were given in homeopathic doses, after the manner of Hahnemann, diluted up to the millionth or ten-millionth part, I do not know as it would have any effect; but I do not think that any substance whatever which, used in ordinary quantities, is actively harmful, should be permitted, under any form or in any quantity, to be used in any food ingredients.

The CHAIRMAN. Do you think that the quantities in which they are used in these preparations are dangerous to health?

Answer. I do not know what proportions they are used in, sir. That varies with the individual using them.

The CHAIRMAN. At all events, would you think that preparations of that kind should be distinctly labeled so that people could know what they are using?

Answer. I think that those substances should be forbidden.

The CHAIRMAN. Forbidden altogether?

Answer. Yes, sir. All substances which could possibly be injurious I think should be forbidden. Where a mixture contains substances which are entirely harmless in gross quantities they should be labeled as mixtures.

The CHAIRMAN. What is your opinion as to the harmfulness of the ordinary aniline dyes? Are there any of them that are harmless, so far as you know?

Answer. I do not know whether any of them are harmless or not. I do not know, as a matter of fact, whether any of them are harmful, except in appreciable quantities. At the same time, I would prohibit the use of those which could be shown to be harmful in appreciable quantities. So far as I know various aniline coloring matters have not been sufficiently investigated by chemists or physiologists. The functions of the chemist are to determine the nature of the stuff. The functions of the physician are to determine its effects, which can

only be done by experiments entirely outside of chemical laboratories and by experiments which are more or less costly.

The CHAIRMAN. These aniline dyes are more or less used for the purpose of giving an artificial color to various things?

Answer. So I believe.

The CHAIRMAN. Foods of all sorts?

The WITNESS (continuing). And so I know, as a matter of fact, that some of them are used in connection with butter, but whether harmful or not I do not know. I know that they are used in connection with wines. In France they were formerly used to a considerable extent, but that has been corrected in great measure by legislation, and there they were distinctly found to be injurious. Some of the aniline colors contain arsenic as an accidental impurity, not as an adulterant, but they are not sufficiently purified; and arsenic has been found in that class of anilines known as rose aniline, magenta, and fuchsin, etc. I have met with the liqueur known as crème de menthe, which, instead of being colored with a natural coloring matter, the plant peppermint, the chlorophyl, was colored with methyl green. In other words, the stuff was not made from mint, but was probably a mixture of methyl and sugar, wood alcohol, and methyl green. I do not know that that substance is injurious; but if I have my choice, I prefer straight goods, and when I order crème de menthe as a beverage I should be protected in some way in getting what I order. In other words, as the English law expresses it, I should have a substance of the nature and kind demanded, and not some other kind.

The CHAIRMAN. Are the liqueurs, as far as you know, adulterated or really frauds? From your description of crème de menthe, that is really a fraud right through.

Answer. That is a fraud right through, and I presume there are others. I know that simply from reading and from competent report. I am not an analytical chemist, and have not made many analyses myself.

The CHAIRMAN. Have you any knowledge of, or are you familiar with, flavoring extracts?

Answer. No, sir; only in a general way, from reading.

The CHAIRMAN. Or sirups?

Answer. Well, sirups, I believe, are made very largely from glucose, and, as I have before stated, I believe glucose to be harmful.

The CHAIRMAN. You can not mention any other food product of importance that you have any knowledge, concerning the adulteration of which you have any knowledge?

Answer. I have not investigated, Mr. Chairman, these others, and I only know the adulteration from general report and reading, but I believe that they are very largely adulterated. I think that, as regards the question of adulteration, the matter of harmfulness is not the only matter which should receive the consideration of your committee.

The CHAIRMAN. I should have stated to you, perhaps, at the beginning that the committee considers this subject divided into two branches: The consideration of those substances which are deleterious to the health of the public, and those which are simply fraudulent and intended to obtain something for nothing—not actually injurious, perhaps, but which are frauds upon the pocketbook.

Answer. The chemist, with his special science, is enabled to determine many mixtures very readily and to determine many adulterants.

There are many others which are not so readily determined by chemistry; in fact, which chemistry almost fails to determine, but which are readily determined by the microscope. So there are others which are more readily and quickly determined by the spectroscope than by either the microscope or the chemist. Now, a mixture of wheat flour with corn flour a chemist would have difficulty, I fancy, in determining. The microscope would answer the question in a very few moments. So with the various coloring matters. The spectroscope would yield very prompt information; much more so than either chemistry or the microscope.

Senator HARRIS. Well, Doctor, I believe that is all, unless you have some statement which you wish to make.

The CHAIRMAN. What do you say about alum as a food product?

Answer. I do not care to eat any, sir.

The CHAIRMAN. As used in baking powders, have you had any occasion to consider that question?

Answer. No; I am not an analytical chemist. I am a physician.

The CHAIRMAN. I beg your pardon. I asked the question because I was absent.

The WITNESS. I would make the statement to the chairman that I do not come to Chicago with a view to testifying before this committee. I am here on other business, and learned of the presence of the committee incidentally through the papers.

The CHAIRMAN. We learned incidentally that you were here, and wanted some of your advice, and we are very thankful to you for your kindness.

Dr. PIFFARD. I would like, if I might, to say one word, Mr. Chairman, and that is that I hope that this committee will incorporate something in the proposed legislation covering the matter not simply of foods and drinks, but of drugs. There is not time to go into that matter before this committee; but the United States Government does a great deal already in the way of prevention of adulteration by refusing admission into this country of adulterated and an inferior quality of drugs from foreign countries; but it does not do anything or it has not the power at present to prevent their adulteration after getting here. A man, for instance, will import fresh rhubarb of the best quality, but after it gets here no one knows what he may mix it with. He may buy it at \$2 a pound, and he may powder it and mix it with an inferior inert substance—if you please, starch—and sell it for \$2 a pound.

The CHAIRMAN. That becomes a fraud upon the consumer—upon the consumer who buys it and does not have time to analyze it?

Answer. Yes; in most of the States there are laws governing the adulteration of foods and the adulteration of drugs, laws which, on their face, look to be pretty good ones, but which are insufficient, either through the failure of the necessary appropriation to enforce them or through the failure of those whose business it is to enforce them, to know sufficient about the subject to do it. We will take, for instance, a health board—I will not say in what State—which has ample powers. It will have this year plenty of money. It lacks one thing only—brains; and it lacks another thing, too, and now I will speak anonymously. I read the report of one chemist, whose name I will not give, in which he stated that he did not think that it would be judicious for the body which employed him to take any action against the brewers, as that was such a large

interest. I made up my mind that the fellow was either a fool or a knave, and I don't know which. I had occasion to read the report which he made to the committee which controlled him—which employed him.

The CHAIRMAN. Then you would not recommend this committee to stop this investigation concerning the food products which are deleterious to health and are frauds upon the people simply because it may touch some interest. I quite agree with you upon that point. Doctor, you say, in a general way, that in your opinion you know that drugs are adulterated, some of them with a view to defrauding the consumer, the purchaser; and do you find that some of them are adulterated in a way that makes them dangerous, or is it simply, as a rule, a fraudulent adulteration?

Answer. It is usually an adulteration for the purpose of cheapening.

The CHAIRMAN. Then, if you were to prescribe, for instance, quinine, it would be a dangerous thing if it was reduced—if you wanted to give 5 grains and in giving 5 grains you only gave 1 grain—it is a dangerous thing to permit such adulterations, is it not?

Answer. Yes, sir.

The CHAIRMAN. I will say to you that the pure-food bills heretofore have had pure drugs connected with the pure foods and, for some unknown reason, we have hardly ever been able in all the years gone by to secure any protection on food because the drug part of it was either so much at stake or infringed so much upon some folks' interest, which they called vested rights, that no legislature has been able to touch it. So that I, personally, in drawing my resolution, took food products alone, and separated them, to get at a little at a time.

The WITNESS. There is another point in connection with drugs which I would like to bring forward, Mr. Chairman, and that is the offering of mixtures by certain manufacturers under names which give a false idea of their composition. I have one such mixture in mind now. We have all of us heard, probably, of bromo-seltzer. The general impression is that bromo-seltzer is composed largely or wholly of bromide of potassium, or some other bromide, and the ingredients which are natural, more or less, to the seltzer water. Now, as a matter of fact, some of these bromo-seltzers which are offered for sale by the druggists to the casual purchaser contain very little bromide of potassium, and their effect, such as it is, is not due to the bromide of potassium, in the main, but is due to something else, and that something else is put there because it has an effect somewhat resembling that of bromide of potassium, but at the same time is a much more dangerous substance. My attention was brought to that matter by a brother physician who had a case of acute poisoning from so-called bromo-seltzer. He found out where it came from and called on the apothecary who put it up, and the apothecary admitted, after pretty serious urging, or threats, rather, on the part of the physician—he was going to make a coroner's case of it if the man died—he admitted that the stuff was mainly acetanilide.

There is a poisoning case in New York which has attracted some attention, the Adams poisoning case. This woman was poisoned, or died, rather, after taking something contained in a bottle marked bromo-seltzer, and on chemical examination it was found that the active poisonous ingredient had undoubtedly been added to the bromo-seltzer mixture, and was cyanide of mercury, but the chemist, rather innocently, without commenting on the fact at all, stated that there was also in it acetanilide. So I presume that the use of acetanilide in

the place of bromide of potassium is rather prevalent in those bromide mixtures, and I do not care how widely that is known to the public.

Now, acetanilide costs less per horsepower of effect, if I may so state, than bromide of potassium does, and it is used, therefore, simply as a cheapener and without any regard to the possible dangers of it.

STATEMENT OF ALBERT B. PRESCOTT.

ALBERT B. PRESCOTT, being first duly sworn, testified as follows:

Examination by the CHAIRMAN:

Q. Will you give your full name, please?—A. Albert B. Prescott.

Q. Where is your residence?—A. Ann Arbor, Mich.

Q. And your profession?—A. I am a chemist, and college teacher of chemistry and allied subjects.

Q. How long have you been engaged in the study and practice of chemistry?—A. Since 1865.

Q. Did you graduate from any college or university?—A. Yes, sir.

Q. From what?—A. From the University of Michigan.

Q. And what is your position there now?—A. I am director of the chemical laboratory and dean of the school of pharmacy, and professor of organic chemistry.

Q. Doctor, I have taken the liberty to send for you because I heard you were here in the city, and I wanted your opinion in regard to some matters in your profession, for the benefit of Congress; and I would like to have you state in your own way your opinion as to the use of preservatives or antiseptics in the articles of food and drink which are manufactured and sold here—whether you consider them deleterious to health or not. State your own opinion and information on that subject.—A. I believe that in general preservatives and antiseptics in food are unfavorable to digestion and injurious to health, and they invite the use of certain grades of food which otherwise would not obtain.

Q. In other words, let us see if I understand you. The use of antiseptics permits the use of a large number of different products which could not be used if they did not use antiseptics?—A. Quite so. And an article which the consumer would reject if it were not for the antiseptic, and which is not rendered wholesome by the antiseptic, although its decomposition may be delayed or even prevented, yet an article as food is not rendered entirely wholesome. I believe that, as constituents of food, preservatives should be either prohibited by law, or announced upon the label or in the name of the food. There may be some cases where it would not be expedient, as I judge—claiming no maturity of judgment on that point—it might not be expedient to prohibit the use of preservatives. The term "preservative" is of variable meaning. Common salt might be counted as a preservative, but it is not wholly such. It is in itself an article of food. Without undertaking to say how far preservatives should be prohibited by law, I believe that if not prohibited they should be announced either by labels or in the name of the food.

Q. What are some of the most common antiseptics used, Professor?—A. Of what we call antiseptics, perhaps salicylic acid has been used more than any other one. Borax is largely used. Formaldehyde is coming into quite general use.

Q. We will take salicylic acid. What is the effect of its use, physi-

ologically?—A. The effect of its continued use is injurious to the organs of secretion of the body. I wouldn't undertake to define, as a physician, just what those effects are, but they are recognized by sanitarians all over the world.

Q. Formaldehyde. Professor Mitchell testified that he found it in an article called "freezine." He testified that some days ago. How is that made?—A. It is made by limited oxidation of wood alcohol.

Q. It is a product, then, of wood alcohol?—A. Yes, sir.

Q. And wood alcohol is an alcohol distilled from wood?—A. Yes, sir.

Q. Is it at all fit for consumption in the human body?—A. No; it is not as an article; it is not as the article is furnished.

Q. Wood alcohol is poisonous, is it not?—A. If it is not absolutely pure; it may have its place as a medicine, but it has no place as a food.

Q. I just happen to remember to have seen in the paper the account of the death of a man who drank wood alcohol by mistake.—A. These quite poisonous substances are included in ordinary crude or artificial wood alcohol.

Q. What do you say as to the wholesomeness of formaldehyde?—A. I count it as injurious and unwholesome. I can not say how far it causes injury by its direct effects. I doubt not that it does to some extent. I would not undertake to say on that point, but I am sure that it causes injury by interfering with the digestive processes, as, indeed, all antiseptics do and must do from their very nature. That agent which will prevent fermentation, putrefaction, organic decomposition, will prevent the processes of digestion by virtue of the same power, and an antiseptic is in greater or less degree an antidigestive by virtue of its character.

Q. And your recommendation would be, then, that wherever it is used at all in a prepared article of food it should be so marked and labeled upon the outside?—A. If allowed to be sold it should be announced.

Q. But you would not recommend, would you, to the committee that it should be absolutely prohibited?—A. Well, I can hardly answer that question.

Q. That is, a certain class of antiseptics?—A. I think it would be expedient and wise to prohibit the use of, for instance, salicylic acid in malt liquors and wines, and the introduction of preservative agents into foods in other instances.

Q. Have you had any occasion to analyze baking powders?—A. I have made some analyses, yes, at one time and another; a good many analyses of baking powders.

Q. What is your opinion as to the baking powders, as to how they should be branded or marked? You understand that we have two branches of this inquiry. One is to determine and report to the Senate what food products are deleterious to health, and what are not necessarily deleterious to health, but are simply frauds upon the consumer. Are there any baking powders which you have examined that you consider deleterious to health—the contents deleterious to health?—A. I think the constituent of baking powders most objectionable, so far as I know, in this country at present, is alum. The term "baking powder," without qualification, carries to the public mind, I believe, an impression of a tartrate baking powder, and I am not quite sure, but I am inclined to think that any other baking powder than that made by mixing cream of tartar and bicarbonate of soda and a due quantity of filling—that any other baking powder should have its composition announced on the package. At any rate, I am

very sure that any baking powder containing alum, if allowed to be sold, should have the presence of the alum clearly stated on each package.

Q. What is alum?—A. Alum is a double sulphate of aluminum and an alkali metal; aluminum and soda, quite generally.

Q. How is it made? I don't understand. You say it is a product of aluminum and soda?—A. Yes; it is a combination of one acid and two bases, one of which is aluminum and the other an alkali metal, made by the manufacturing procedure. As a salt of aluminum it contains an astringent which has an effect on the human system and digestive apparatus in the nature of a medicinal effect; medicinal when applied with remedial intent, but injurious when taken habitually day after day and indiscriminately by those who do not know what it is.

Q. The suggestion has been made by some other witness—and we wish to hear all sides—that alum undergoes a change in baking, so that when it goes into the stomach there is no alum in the stomach. What change does it undergo in baking, if you know, Doctor?—A. In the mixing of the bread sponge, of course, it undergoes a change; otherwise it would not be a baking powder at all. It is designed to give rise to carbonic-acid gas and does undergo a change. I know the claim is made, which I have considered a great many times, that it becomes nearly or quite insoluble, and therefore inert in the stomach. Now, doubtless some portion of the alum does become very difficultly soluble in the stomach, and not all of the alum comes into solution in the stomach. Nobody can tell how much. No two stomachs are in exactly the same condition. The contents of the stomach, the chemical agencies of solution in the stomach, are very, very complex; in fact, too complex to be fully defined by chemistry at the present time. The alum is liable to go into solution, and if not fully dissolved when in the condition of aluminum hydrate or other compound of alum in contact with the acidulous and albuminous fluids of the stomach it is liable to go into combinations with the digestive agents of the stomach and with the principles of food, the constituents of food, so as to have its effect as an astringent and a precipitant, which effect, though very slight, when continued from month to month and year to year, tends to impair the sources of nutrition.

Q. Have you analyzed jellies?—A. Not very much myself. I have seen analyses of them.

Q. Or sirups?—A. I have analyzed sirups to some extent.

Q. The distinguished doctor who was on the stand just before you testified as to the use of glucose. Have you any opinion as to whether that is necessarily a healthy food product or not?—A. Yes, sir; I have an opinion.

Q. What is it, Doctor?—A. Well, it is that glucose is a food by itself and, I think, deserving of recommendation and toleration as food. How far it is a wholesome food—I mean to say for how many individuals, how many persons it is a wholesome food—I can't say, and the public have had very little opportunity to judge, because the consumer does not know when he is obtaining glucose and when he is obtaining some other sugar, and I believe, if I may be permitted to express an opinion—

The CHAIRMAN. That is just what we want.

Answer. It is one which has perhaps become a hobby with me, that the substitution of one wholesome food for another, unknown to the consumer and the public, is a sanitary offense, for what is a wholesome

food for one man is not a wholesome food for another man, and most of the members of the community whom I meet profess to have some experience as to what food is beneficial for their own digestion and what is unfavorable to their digestion, and if substitutions unknown to the consumer are permitted that experience goes for nothing and the public are discouraged in attempting to obtain experience.

Q. Then you hold that the substitution of what may be a pure food for some other pure food is not only fraud upon the public but is a sanitary offense?—A. I believe it to be a sanitary offense.

Q. As well as a moral offense?—A. I have said that it is difficult to find two stomachs that are alike—as difficult as it is to find two faces which will look alike—so that we could not distinguish one from the other. From the extreme complexity of the digestive process and the highly organized condition of the human body, it becomes impossible, by chemical analysis, to say precisely what food would be the most favorable to digestion and harmless, for a given individual. People find out by experience. We hear men say every day, "I can't eat fish." We hear men say every day, "I can't eat potatoes." We hear men say every day, "I can't eat this or that article of food." The witness who preceded me said he had been greatly injured by malt liquor made from rice. That may be a universal experience, but it doesn't follow that is the universal experience because it was his experience; but it does follow that he should be protected in his undertaking to get malt liquor made from barley when that is his purpose.

Senator HARRIS. You said a while ago something in regard to jelly, I believe. It was testified here a day or two ago by a manufacturer of jelly that he used some acid which hastened the jelling of fruit extracts. He said it was an imported acid, I believe, and did not know what its composition was. In analyzing jellies or fruits, or anything of that kind, or in any analyses which you have seen, have you recognized any such acid?

Answer. I have not myself made analyses of jellies.

Q. From your general information, has any such acid been known to you?—A. I know that jellies are largely made up of artificial mixtures or acids, namely, gelatin, etc., and given the name of the jelly of this or that fruit. That is an instance, a very flagrant one, I think, of injurious substitution of foods.

Q. I thought so, and I am interested in endeavoring to ascertain what acid could be used for such a purpose, or if you know of any acid that is commercially sold for any such purpose.—A. I have not information on that point.

Q. There is another matter that I feel interested in, for the benefit of your knowledge given to the committee upon, and that is with regard to the general use of coloring matter.—A. Coloring matter is used largely in butter and oleomargarine. Those are two specific things of general consumption.

Q. Have you analyzed these substances so as to know what is the general coloring matter used?—A. I have in the case of oleomargarine within the past year or year and a half, quite a good deal.

Q. What did you find to be the character of the coloring matter?—A. Coal-tar colors; chiefly that class of coal tar called azo dyes.

Q. What is generally known as aniline dyes?—A. The term "aniline" is applied to coal-tar colors, covered by the term "aniline." Azo dyes have been declared to be poisonous; but to what extent or degree, or how far they are poisonous, I do not know. I believe they are objectionable in food, at least until it shall be known and determined

which of them are harmless; and I believe that any coloring matter which tends to deceive the consumer as to the article of food that he is buying is indirectly injurious, for the reasons I have stated.

Q. Well, you say you found them in oleomargarine?—A. Yes, sir.

Q. What about coloring matters used for butter?—A. I haven't made analyses of them. I have been about to do so, but haven't got at it.

Q. Of course the same color sought for in oleomargarine is sought for in coloring butter?—A. Annatto, a vegetable coloring, is the only one which has been used in butter colors. Some years ago I analyzed butter colors submitted to me from time to time, and found them generally some preparation of annatto, which would not be objectionable; but I would not be surprised if some of the ordinary butter colors in use now contained coal-tar colors.

Q. It would be reasonable to suppose, I think, without expressing any opinion as to the fact, that the coloring matter found desirable in the manufacture, on a large scale, of oleomargarine would be found desirable in the manufacture of butter on a large scale, and I wanted to know whether the manufacturers of both articles practically use the same amount of coloring matter?—A. I don't know. Butter is not manufactured on so large a scale as the oleomargarine.

Q. Possibly not.—A. And it has not been found, perhaps, so important to obtain a color that will not fade in the case of butter as in the case of oleomargarine. The azo dyes have an advantage over annatto in that regard.

Q. More permanent?—A. The color is more permanent.

Q. You expressed an opinion, I believe, just now that gave me the impression that you regard the use of artificial coloring matter, as a rule, as objectionable?—A. Objectionable if the color itself be objectionable, and, in the second place, objectionable if it deceives the purchaser into thinking that he gets one thing when he is actually getting another.

Q. Well, that would also apply to grades of the same thing?—A. As to grades of the same thing, it would apply in a lesser degree as between winter butter and summer butter. It would apply in a lesser degree because the difference is not nearly so great as it is between butter which comes from milk and oleomargarine.

Q. It is simply a question of degree?—A. Yes.

Q. In regard to the coloring matters used in jellies. Take the subject of jellies and pickles. Have you any knowledge of injurious substances, aniline dyes, which are used in those cases?—A. I have not. I have given some attention to the matter of the copper-green of pickles, peas, and other vegetables, as a matter of coloring, which has been very much in controversy among sanitarians.

Q. You think that such an ingredient is used?—A. It is used quite largely. I believe alum is also used somewhat in fixing the color of pickles. It is a mordant and fixes the color. In fact, copper sulphate acts more as a mordant than as a direct coloring agent proper—quite as much or more so. And alum serves in fixing the colors.

Q. Would you be inclined to think legislation wise that would prohibit the use of coloring matter altogether? On which side, I mean, would the safety lie?—A. I would advise that it be prohibited or declared on the label; but I would not undertake to say that it should be prohibited in all cases.

Q. I believe it has been stated that in a great deal of confectionery absolutely dangerous coloring matter is used. Have you any knowl-

edge of coloring matter of that character used for that purpose?—A. I have not made analyses of confectionery; no, sir. I know it is colored. Some of the European governments have issued from time to time lists of colors which the law would permit, which were not prohibited, as harmless colors; but with regard to confectionery, I think that is very wise.

Q. They took the ground that it was easier to make an exception of those which are healthy than to make an exception of those which are injurious?—A. Yes, sir; I believe so.

Senator HARRIS. A very safe principle. [Addressing Chief Chemist Wiley:] Do you desire to make any further inquiries, Professor Wiley?

Chief Chemist WILEY. I would like for Dr. Prescott to say something in regard to the use of borax. He spoke of other preservatives, and that is one which is coming into very general use, especially in butter.

Senator HARRIS. Doctor, we would be glad to have your opinion on the use of borax as a preservative.

Answer. Well, I think what I said regarding salicylic acid applies to borax. That has much force as to salicylic acid. That has much force. If there be any difference between them it is one of degree, and I would not undertake to say what degree of difference, but not sufficient to make any difference in legislation.

Chief Chemist WILEY. You would make the same remark in regard to sulphite of soda?

Answer. Yes, sir; I would. I will say again that preservatives are necessarily antidigestive, which, if there were no other reason, should cause them to be excluded.

Senator HARRIS. There is one other thing I would like brought out on the subject of baking powder, and that is in regard to the nature of cream of tartar as compared with alum, the one being a product of nature and the other a chemical compound.

Answer. Cream of tartar is a constituent of fruits, especially the grape, from which it is obtained, because it is the only acid of the grape. I believe that the acid salts of the fruits are among the most wholesome and important constituents of the food of man, those constituents which, when entirely lacking, leave sailors and soldiers victims of scurvy. The fruit acids I believe to be excellent articles of food. Not all natural substances are wholesome articles of food, but cream of tartar has a high rank as such, both in itself and in what it leaves behind after the process of leavening and baking of bread. It is left behind as a salt or tartaric acid, a salt called Rochelle salts, which, in large doses, is very slightly laxative and favorable to the activity of the glands, but in doses in which it occurs in food having only that favorable effect which fruits have as articles of food.

Q. Those properties you would not consider to be possessed by alum made by chemical means?—A. Quite the contrary.

Q. Then you would regard the residue left from the cream of tartar baking powder as favorable to health and the residue left from alum baking powder as injurious to health?—A. Quite so, in both cases.

Senator HARRIS. You made a general observation, Doctor, which struck me with considerable force in the early part of your testimony, as to the effect of antiseptic preservatives in increasing or encouraging the use of foods which either could not or would not be used otherwise. Now, to make a sort of specific application of that remark—I want to get it so it will have as much effect as possible—you think,

unquestionably, that the use of antiseptics and preservatives in such preparations as hamburger steak and sausages and mincemeat, and the various characters of chopped meat—that that would be a material element of harmfulness; that it would encourage and increase the use of meats of that character which it would not otherwise be possible to use?

Answer. I believe so, decidedly, in the practical effect. The article of meat which the manufacturer would not otherwise venture to put on the market he might venture to put on the market by treating it with an antiseptic, when he should be compelled to use the antiseptic in the fullest possible amount. An article of milk which was just beginning to sour, so as not to be in a favorable condition—in the favorable condition of fresh milk—could not be distributed to customers without the addition of an antiseptic; but the vendor might, by checking all further change, almost or quite bring it back again to something like an inoffensive condition, so that it would be acceptable to the purchaser and not be offensive to the senses, and still it would lack the wholesome character of fresh food.

Q. So that, even if it were possible that there should be some shade of doubt as to the direct harmfulness of the antiseptic itself, the injurious effect resultant would be sufficient to place us on our guard, at least, very seriously?—A. It would. However, it must be remembered that some articles of food are preserved very properly. We have preserved meats. We have salted meats, which, in a sense, are preserved meats, and, though salt is not practically classed among antiseptics at the present time, yet, if we were to be critical about definitions—

Q. Then there would be this distinction at the same time, that salt is recognized as one of the essential elements of human food?—A. Yes.

Q. Necessary to the system?—A. That is so.. Besides that, however, it is a preservative.

Q. That makes a marked distinction between it and other preservatives?—A. Yes.

Q. I know that the assertion has been made during our hearings here that salt is a preservative, but I think the distinction between salt as a preservative and some of these others is very marked.—A. Yes. Well, as to the absolute rejection in all cases of such an article as saltpeter or niter in the preparation of ham I would not undertake to decide.

Q. Well, possibly, then, it would be wise to follow the example of foreign governments, which you mentioned, where they state what are harmless and healthful articles of food in such cases?—A. Yes, it would be; and to recognize them any legislation upon antiseptics and preservatives should necessarily define them by some limiting terms.

STATEMENT OF VICTOR C. VAUGHAN.

VICTOR C. VAUGHAN, being first duly sworn, testified as follows:

Examination by the CHAIRMAN:

- Q. What is your name?—A. My name is Victor C. Vaughan.
- Q. Where do you live?—A. I live at Ann Arbor, Mich.
- Q. You are temporarily here in Chicago, are you?—A. Yes, sir.
- Q. Do you hold any official position in your State?—A. I am dean

of the medical faculty of the University of Michigan and professor of hygiene in the University of Michigan.

Q. Have you had public connection in Government affairs during the Spanish war?—A. I am still major and division surgeon in the Volunteer Army.

Q. Division surgeon. That makes you ranking surgeon of the division?—A. Yes, sir. I served through the Santiago campaign as such.

Q. Before you enlisted you held, and do you still hold, your position in the University of Michigan?—A. I do; yes, sir.

Q. Permit me to ask you where you graduated as a physician?—A. I graduated at the University of Michigan. I have since studied in Berlin, Paris, and other places.

Q. Have you given the subject of food adulteration some thought?—A. Yes, sir; I have been professor of hygiene for twenty-five years, and I have been very deeply interested in the subject of the adulteration of foods, and I am very glad that there is a probability that the General Government will take up this matter.

Q. You think there should be a national law on the subject?—A. I think there should be a national law, and I am very glad to have the opportunity to testify before you on this subject, because I have certain definite opinions, the result of a good many years of study, and I shall be glad to give them.

Q. We shall be glad to have them. Just state to the committee, in your own way, Doctor, a few of the abuses which you say you would like to see corrected, if there are abuses. I should state to you on the start that we have two branches of this investigation—that is, we are trying to separate those that are mere commercial frauds by adulteration and those adulterations which are deleterious to public health.—A. There are just two kinds of adulterations. Those that are directly detrimental to health and those which are simply pecuniary frauds. Still, however, it is quite impossible to separate these, because an adulteration which may be undertaken for the purpose of pecuniary gain will often injure health. Some people say that sanitarians have no right to discuss those adulterations which are simply for gain and where the adulterant is not poisonous. That is quite a mistaken idea. Let me illustrate. Suppose a child is fed upon skim milk when the parent thinks it is getting whole milk. There has been no harmful substitute added. In fact, there has been nothing added—simply the cream has been taken away in part or altogether. The subtraction is for pecuniary gain. Still, that child may suffer just as much as if a poison had been administered to it, by not getting the proper food constituents. In the same way, if an improper baking powder is used in making a bread, it is not altogether a question as to whether that baking powder is a poisonous substance or not. Another question is whether the bread that is made from it is a good bread or not, because that makes a big difference as to whether the individual is getting a good bread to eat or a poor bread to eat. If he is getting good bread to eat, it probably means health and vigor, and if he is getting poor bread to eat it probably means indigestion, etc. As I say, I have been very much interested in this subject of adulterants and coloring matters and substitutes and surrogates, etc.

Q. What do you mean by surrogates?—A. A surrogate is a substitution. For instance, we have coffee surrogates, such as chicory and various other mixtures; and oleomargarine might be regarded as a substitute for butter.

Q. Now, in regard to the coloring matters.—A. In regard to the coloring matters, it seems to me that it would be wise to name the coloring matters that may be used. I see no reason why certain coloring matters should not be used properly. There is no reason why I should not improve the looks of the food I use. I think the appearance of food has some effect upon its digestibility—putting it in good shape—and I see no reason why butter could not be colored with annato. Of course we demand June butter all the year round.

Q. What is annato?—A. Annato is a vegetable coloring matter. Of course, the general object of all coloring matter is, as has been stated here, to enable the seller to sell an inferior grade in place of a better grade.

Senator HARRIS. At a higher price?

Answer. At a higher price. For instance, oleomargarine men color their oleomargarine in order that they may sell it as butter. I think there would be no objection to their coloring their oleomargarine if they still sold it, or the Government made them sell it, as oleomargarine, provided that the coloring matter was harmless and did not in any way interfere with the digestibility of the material. That is what I think about coloring matters in general.

Q. That applies to butter as well as to oleomargarine?—A. Yes, sir; it applies to butter. The Government would best serve the people of this country by specifying the coloring matters which may be used in butters and butter substitutes, and then, of course, afterwards the coloring matters might be added. I have never found any poisonous coloring matters in sufficient quantity to act as butter or oleomargarine. Of course, there are poisonous substances, in considerable amounts, sometimes found in confectionery. The anilines are often contaminated with arsenic, and this results in the proportion of the aniline—

Q. Just to interrupt you a moment, Doctor. Have you analyzed the coloring matter used in butter and oleomargarine?—A. Yes, I have made a good many examinations of that.

Q. It is asserted now that aniline coloring matters are largely used.—A. They are. I think annato is but little used now. It was used a good deal formerly. But the azo compounds, which are aniline compounds, are used almost exclusively, for the reason that Dr. Prescott stated, that they give a more permanent color.

The CHAIRMAN. But you do not consider those healthful, generally speaking, those aniline colors?

Answer. I do not think the aniline colors used in the methods in which they are used, either in butter or oleomargarine, are harmful at all. I am very positive about that, and I think that their use might be permitted within certain limits, of course, as to quantity. Of course the amount is very small, but I say the reason the oleomargarine man colors his product is that he may sell it as butter.

Senator HARRIS. For the same reason that the manufacturer of winter butter colors it to resemble June butter?

Answer. Exactly. It is the same fraud. One is just as much to blame as the other. Is there any further question on colors?

The CHAIRMAN. No, I think not. Take the question of preservatives, if you will.

Answer. As to preservatives, I think there are some preservatives which must be allowed in certain foods. As a rule, their use is to be condemned, for two reasons. In the first place, like coloring matter, it enables a man to sell a poor-grade article in place of a better

grade; and, in the second place, it enables the manufacturer to be less careful in other means of preservation. For instance, if he is putting up a can of peaches or pears, or anything of that kind, if he will add a little salicylic acid he need not be so careful in his sterilization. That is a very important thing. I do not think salicylic acid, or butyric acid, or anything of that kind ought to be allowed in preserving fruits or jellies, because if the sterilization is complete those things can be kept without any antiseptic added.

Q. Sterilization means to heat?—A. Yes; heat and properly seal. That is all included in the word "sterilization." I don't see how we would get along with our cider unless we used a little salicylic acid, not if we wanted to keep it, and I think in such cases as that that salicylic acid would be allowed as a preservative.

Senator HARRIS. In a prescribed amount?

Answer. In a prescribed amount, yes; that it should not exceed a certain amount. I have seen at least one person very severely poisoned from drinking cider which contained a very large amount of salicylic acid. I think, as a rule, preservatives should be condemned.

The CHAIRMAN. What do you say about using it in beer—salicylic acid?

Answer. I don't think there is any need of using salicylic acid or any other preservative in beer, if it is properly made, and especially the so-called export beer, if it is properly sterilized. There is no need whatever for the addition of any salicylic acid or any other preservative. Now, as to the jellies. As we all know, most of the jellies are made from apples, and they are made by the action of some dilute acid, and this acid is generally hydrochloric acid. Sometimes sulphuric acid is used. Of course, it is a diluted preparation of either hydrochloric acid or sulphuric acid.

Senator HARRIS. Does that promote the process of jellying?

Answer. Yes; it breaks down the fruit and makes a jelly of it more readily than it would be done by the ordinary method. I have examined a number of those preparations which are used for jellying fruits, and most of them that I have examined have been hydrochloric acid. If my memory serves me right, I found one that had sulphuric acid in it. Now, I don't see why very dilute hydrochloric acid might not be used in jellying fruit. I should object very much to the use of sulphuric acid, and I think when it is used it ought to be so stated on the label. I don't think hydrochloric acid is present in sufficient quantity in the jellies which I have examined, at least, to be of any harm. Hydrochloric acid is a normal constituent of the stomach, and I should be in favor of permitting the use of such a method of jellying, provided, of course, that it was stated on the label. Then, of course, the jellies are flavored. They take apples and make all kinds of jellies, pear jelly, quince jelly, pineapple jelly; and all these from the same fruit. That is done by adding the flavoring material of that fruit, the ether, butyric ether, and the coloring. Of course, they are all colored by the anilines. All of this should be controlled by law.

Senator HARRIS. The flavoring matters of some fruits are not obtainable; in those cases chemical preparations are used?

Answer. Yes, sir.

Q. Take, for instance, pineapples and bananas.—A. Yes; they use butyric ether, I suppose, for almost all of those things.

The CHAIRMAN. About flavoring extracts, Doctor?

Answer. I have not known very much about flavoring extracts, practically, but of course most of them are artificial. They are made

up from these chemically prepared ethers, etc., such as butyric ether and others.

Q. I have just received some information that in some of these factories they use wood alcohol, which is much cheaper than ordinary alcohol.—A. The use of wood alcohol certainly is to be condemned. It is a poisonous substance, even when pure, and is, as ordinarily used, a very poisonous substance, and it certainly ought to be condemned. There can be no question about that. There can not possibly be any question about that. Now, ground coffees are largely adulterated. I suppose most people know that these coffees are adulterated. Some of them have no coffee in them at all, but still they are sold as coffee. And then there are coffee substitutes, which are sold in some parts of the United States as brands of coffee—Father Kneipp's coffee. Everybody who knows anything about it knows that there is no coffee at all in that; but the Government allows it to be sold as a coffee, and many people who buy it think they are getting a special brand of coffee.

The CHAIRMAN. Many of us buy for the use of some members of the family a certain coffee that we know to be a cereal coffee. There is no objection to that, is there?

Answer. No.

Senator HARRIS. It is a substitute for coffee?

Answer. It states that it is a coffee substitute.

The CHAIRMAN. How about baking powders; have you analyzed them?

Answer. Yes; I have analyzed a great many baking powders. The baking powders most commonly in use in this country are the tartrate and the alum baking powders. The tartrate baking powder is the ideal baking powder. That consists of the acid tartrate of potash, which is obtained from the grape. When the wine ferments the alcohol is formed, and the tartrate, being less soluble than the alcohol, that acid is precipitated onto the sides and bottom of the cask, and this is taken and purified and mixed with bicarbonate of soda and a little starch, to keep it dry and to act as a filler; and when it is mixed with water and mixed with the bread the acid tartrate decomposes and sets free carbonic acid, which causes the bread to leaven and rise and makes it porous, and of course the object of making bread porous is to improve its digestibility. Within certain limits the more porous the bread is the more readily is it digested, because the gastric juice and other secretions get into the pores better. More or less of it remains even after mastication, and it aids in digestion. So I think there can not be any objection to the use of the tartrate baking powders. On the other hand, I am quite positive that the alum baking powders should be condemned, and for these reasons: In the first place, the action of alum on the bicarbonate of soda is irregular and uncertain. No chemist can mix those substances in such proportions that under all conditions it will give off a definite amount of carbonic-acid gas, and consequently the kind of bread formed with an alum baking powder will vary, and vary under the conditions of temperature and amount of water or kind of dough and conditions which the maker of the bread can not know or control. That is one reason. The bread is liable to be inferior.

The second reason is this: The alum works upon the bicarbonate of soda so slowly and imperfectly that in a great many cases the residue of the alum is left unchanged, and that is liable to be harmful. We know that alum in large doses is seriously harmful, and even in small quantities, in doses of 5 grains or more, it is an astringent, and it inter-

teres with the secretion of the gastric juices and has an astringent effect upon the intestines, is liable to cause constipation; and for these reasons it is injurious, especially when it is taken two or three times a day over a long period of time.

Then, again, even when the alum undergoes decomposition, it forms either the phosphate of aluminum or the hydrate of aluminum, or both, and both of these are soluble to some extent in the gastric juices of the stomach, and both of them are soluble in albuminous substances. They are taken into the system in small quantities, it is true, but it is a harmful substance, even in small quantities, and is injurious.

Q. Is alum found in any natural product?—A. It is not found in any natural food; no. Of course there are waters that contain forms of alum, natural waters; but the tartrate of potash is in the grape, which is a natural food. I believe the grape contains about 1 per cent of acid tartrate of potash, and of course in eating a pound of grapes one would get from 4 to 5 grains of tartrate of potash, and no one would claim that that was injurious; and, besides, the substance that is formed from the action of the tartrate of potash on the bicarbonate of soda—these Rochelle salts—is not injurious. In fact, these acid salts, as Dr. Prescott has said, are beneficial to the body, as is shown by the fact that they prevent scurvy, etc.

Q. You have testified about coloring and coloring matters generally—as to butterine and other food products, I believe?—A. Yes. I understand (I don't know how true it is) that flour is being adulterated now with starch. I have never seen such an adulteration myself, but I have had trustworthy information that such is the case.

Q. There has been a question here that I would like to have your opinion on, as to the fixing of standards. It is a very difficult matter when you come to see the great variety of things which are put upon the market as pure foods—it is a very difficult matter to get a general law that will not work hardship in some particular cases. The consensus of opinion is that each article ought to be marked for what it really is, without necessarily disclosing trade secrets or giving the exact quantity of ingredients. But take coffee, for instance, and cloves—oil of cloves. There is a national board, the United States Pharmacopœia. They have fixed standards, and they have been adopted by the Government Department?—A. Yes.

Q. For instance, one witness has testified that in the importation of opium it must contain a certain amount of morphine in order to be considered opium. That was to stop its adulteration. There is a fixed strength for oils and extracts fixed by that board. What suggestion would you make to this committee as to fixing standards for foods?—A. I think it would be quite impossible to fix standards for all foods as you do for medicines. Of course for milk you could fix a standard. You might say that milk shall contain such a percentage of milk solids, and not less; but I don't see how you can fix a standard for bread and meat or anything of that kind.

Q. How about beer, for instance?—A. I think there ought to be a fixed standard for those things, yes.

Q. For manufactured articles?—A. Yes.

Q. Prepared and sold in packages?—A. Yes.

Q. How would you constitute that board, or how would you fix that law? Some suggestion has been made that there should be a national board.—A. Oh, there should be, undoubtedly. It is a disgrace to this country that we haven't such a board. We ought to have a national board of health to look after such things, or a national board

devoted to the subject of foods, and not depend just upon a little investigation that a Senate committee is able to give on short notice. And, besides, laying aside all questions of sanitation, it would pay the Government to do it, because, as you suggested a moment ago, it would give our foods a standard value in other countries and it would help our exports most nearly. I don't think of anything else myself at present.

STATEMENT OF H. C. ADAMS.

H. C. ADAMS, being duly sworn, testified as follows:

Examination by the CHAIRMAN:

Q. What is your name?—A. H. C. Adams.

Q. Where do you live?—A. Madison, Wis.

Q. What official position do you hold?—A. Dairy and food commissioner of that State.

Q. Is that an elective or appointive office?—A. Appointive.

Q. Appointed by the governor and confirmed by the senate?—A. Appointed by the governor and confirmed by the senate.

Q. Are you a professional man or a business man?—A. I have been a farmer most of my life.

Q. You have taken considerable interest and studied somewhat this question of food products?—A. I have.

Q. Especially as connected with dairies, I understand?—A. Yes, sir; I have.

Q. Dairy food products?—A. Yes, sir.

Q. In view of your official position, we would like to know what you think as to the advisability of having a national pure-food law and a national board?—A. I think we should have a national pure-food law, beyond any question, and that Congress should go to the limits of its constitutional authority in making that law comprehensive and stringent.

Q. You do not see that it would in any way conflict with, but, on the contrary, would assist, would it not, the States in carrying out these laws?—A. I think so. Of course Congress can not cover this whole subject, because it can only, as I understand it, regulate that matter so far as it applies to interstate commerce, the Territories, and the District of Columbia, but it could do this: It could give to the States of the American Union a model food law. As it is now, we have food laws upon the statute books of every American State. Probably 50 per cent of those laws have been passed during the last five years. Public sentiment has been turned in that direction. But these laws vary in character, and it is simple justice not only to the consumers of this product but also to the manufacturers that, if possible, we should secure uniformity, and the tendency of strong national legislation would be to secure that uniformity.

Q. You have given the subject of butter and oleomargarine considerable study, and the question has been asked and discussed here as to whether we should permit the coloring of oleomargarine.—A. The law of Wisconsin, which I happened to draw, prohibits the coloring of oleomargarine in imitation of yellow butter. Of course the obvious reason for the passage of such a law was to prevent the sale of oleomargarine for an article which it was not; to prohibit its sale as a counterfeit. The friends of the oleomargarine interests insisted that the dairy interests were inconsistent, for the reason that they colored

their butter to prohibit the coloring of oleomargarine. The claim, however, is hardly well founded, because butter is not colored in imitation of some other article, and it is not colored in imitation of a more valuable quality of the same goods. We color winter butter, to be sure, and we color it in imitation of June butter; but June butter will sell largely in Chicago in the winter under its own color, sells more largely than the uncolored winter butter, and certainly no harm or deception can come to the consumer by the coloring of an article in imitation of something of less value. Nobody is harmed or injured. It is done for the purpose of pleasing the eye. The demands of the markets in the United States, so far as this matter of color is concerned, vary. Certain markets require a highly colored butter. Others require a butter of a very much lighter color.

Q. Then, I understand you to take this position, that you objected to the coloring of oleomargarine because it assisted oleomargarine in selling for an article which it was not?—A. That is the objection.

Q. As you say, it does not necessarily follow that this colored butter sells for a higher price.—A. It is not colored in imitation of a more valuable article. That is the point.

Senator HARRIS. Bad butter is.

Answer. Bad butter speaks for itself.

Senator HARRIS. Very loudly, generally; but it is very often sophisticated. For example, the butter which has accumulated in the country-store cellar, which has been in contact with the red herring and the codfish all summer long, and made from an infinite variety of sources, is brought together, manipulated, and colored up. That is butter, of course. It is still butter. But that is palmed off, by means of colors and by means of working over in various ways, as a superior article and at a higher price than it deserves. Is not that the case?

Answer. In our State we passed at the last session of the legislature a law which requires that such made-over butter be labeled; but it is not possible by any process of coloring to make ordinary or poor butter good butter.

Q. You do not require to make it good butter, as a matter of course, but you make somebody who buys it believe it is good butter and pay the price of good butter.—A. Butter is not bought by the eye altogether, but by the eye and the taste.

Q. Well, that is very true, and that ought to protect you gentlemen very largely and thoroughly against this imitation which you complain so much about, if its characteristics are so marked.—A. We complain because another and very much cheaper article is colored and sold for a more valuable article, because it then becomes a counterfeit. My experience in Wisconsin during four years administration of the dairy-food laws of that State is this: That the wholesaler who sells oleomargarine knows what he is selling; that the jobber and the wholesaler in our State who purchase it know what they are buying; that the retailer who has a Government license knows what he buys; that the boarding-house keeper and the keeper of a restaurant and these cheap places where the meals are sold know what they are buying; but the man who boards in the boarding-house and the cheap restaurant and goes around the country does not know what he is buying when he calls for butter and gets butterine; that the butterine is finally consumed as and for butter, and that, no matter how low a grade of eating house it is, so far as cheapness is concerned, men are very rare who will go in there and ask for or desire butterine, and it could not be sold if it was not colored in imitation of yellow butter.

Q. I would like to ask you with regard to this coloring matter. What is that coloring matter generally used in, either or both?—A. There are two kinds of coloring matter on the market at the present time, as the professors have stated—annatto coloring matters and those made with the so-called annilines. The latter have come into more general use lately because of the permanence of color which they give. They are unquestionably poisonous to a greater or less degree. Recently in Wisconsin a child was killed by finding a bottle of one of these coloring matters and drinking a portion of it, whether one or two teaspoonsful, I am not fully informed, but a comparatively small amount, and it resulted in death.

Q. That is the coloring matter which is becoming more popular and more generally used?—A. More generally used by the manufacturers, and it is a question whether or not it could be sold under the pure-food laws of either Wisconsin, Minnesota, Michigan, New York, Ohio, or Massachusetts.

Q. I understood you to say that this coloring matter is used in both of these food products?—A. It is.

Q. Both butter and oleomargarine?—A. Yes, sir.

Q. Do you know anything of the use of boracic acid, boric acid, or any such compound or preservative for butter?—A. We prohibit its use in Wisconsin in milk.

Q. It is prohibited in that State?—A. Yes. We consider it injurious or that the tendency of it is deleterious to public health.

Q. In your experience as a food commissioner is there a desire or tendency to use it if it were not prohibited?—A. Yes; it is very largely advertised in our State, and when used is used as a rule to cover up shiftlessness and carelessness in handling milk, for which there is no excuse.

Q. It is just as was testified a while ago, that the use of antiseptics tends to cover errors and carelessness in preparation?—A. Errors in business. And the tendency is injurious to public health beyond question.

An adjournment was here taken until 10.30 o'clock May 12, 1899.

MAY 12, 1899.

The committee met at 10.45 o'clock a. m.

Present, Senator HARRIS.

STATEMENT OF GEORGE W. YORK.

GEORGE W. YORK, being duly sworn, testified as follows in response to questions by Senator HARRIS:

Senator HARRIS. Please give your name and residence.

Answer. George W. York, 2661 North Robey street, Station X, Chicago.

Q. Your profession or occupation?—A. I am editor of the American Bee Journal.

Q. Mr. York, you are familiar, of course, then, with the production and sale of honey?—A. Somewhat.

Q. We would be glad to have you give the committee any information with regard to adulterations of honey, whether injurious or simply dilutions.—A. We find, of course, that the liquid honey is the kind

mostly adulterated; not that the adulteration is particularly harmful, but more in the nature of deception and fraud upon the public. They adulterate mainly with glucose, which is a very much cheaper article than pure honey. I understand that commercial glucose can be bought for about 1 cent a pound, while pure liquid honey is worth from 7 to 8 cents a pound.

Q. That is simply a mechanical mixture of glucose and honey?—A. That is all—accomplished by the dealers, who buy the honey directly from the producers and then adulterate it after getting it into their warehouses or stores.

Q. You think that is largely practiced?—A. I am very positive of it. You will find it in nearly all the groceries, to the great detriment of the sale of the pure article, which is mainly put up in small glasses, with a piece of comb in the glass and then the glucose poured over it. We have some samples here. If you wish to see them we will be glad to show you what we have found in the groceries.

Q. There is nothing that can be discovered by the naked eye, is there, to show that it has been tampered with?—A. No, sir.

Q. Or adulterated?—A. I think not. The taste, of course, is very distinct—a taste of glucose; at least, I have educated myself so that I think I can spot glucose almost invariably.

Q. Simply by the taste?—A. Simply by the taste—that is, when there is 25 per cent or over of glucose in it.

Q. You do not regard that adulteration as injurious to health, but as simply a fraud upon the public?—A. Not unless the use of glucose is injurious, and I am not enough of a chemist to state that.

Q. Is there any way by which honey in the comb can be tampered with or adulterated?—A. There is not, to my knowledge. All the comb honey upon the market is absolutely pure.

Q. Do the men who keep bees and produce honey use glucose as a food for bees?—A. They do not, for the reason that the bees will not eat it. It was attempted some years ago in Mississippi. Some Chicago bee keepers took several hundred pounds of bees to Mississippi, expecting to feed them glucose. They got them down there and began to feed them glucose, and in a short time the bees were all dead. It killed them. Bees will not eat glucose.

Senator HARRIS. It is not healthy for bees, at least.

The WITNESS. It is not healthy for bees, at least. I am well acquainted with one of the gentlemen who took the bees to Mississippi. He told me this. He was in my office the other day.

Q. How is the sale of honey affected in those States which have pure-food laws, Mr. York? Is the sale of pure honey protected?—A. Yes; to a great extent; but very few States have pure-food laws as affecting honey.

Q. There are a few?—A. I think Minnesota, perhaps, has a pure-food law, and they have succeeded in driving out the impure article almost wholly.

Q. In other words, legislation can be made effective?—A. Yes, sir; it can. And that is all that the bee keepers ask for, is a good law affecting pure honey—that the articles offered for sale shall be labeled.

Q. By a label which will definitely state what it is?—A. Yes, sir. If people wish to buy glucose, they have the privilege to do so, and should get what they pay for. There would be at least five times the amount of pure honey sold in this city or consumed here if people were not afraid of the adulterated article. They are afraid to purchase for

fear of getting the adulterated article. They seem to think that all honey is adulterated. So they are afraid of it.

Q. Is there any other adulterant used that could be considered injurious?—A. Excepting glucose?

Q. Excepting glucose.—A. I think hardly in honey, because of the expense of the other adulterants.

Q. Is there anything ever used in the way of an antiseptic preservative of either pure honey or its substitutes?—A. I think not, for the reason that pure honey will keep almost indefinitely. It needs no preservative. Some years ago they found some honey in one of the catacombs in Egypt, done up with a mummy. That was two thousand years old, but it was just as good as ever.

Q. Does pure honey never granulate?—A. Yes, sir; nearly all pure honey will granulate in time. Some honey requires perhaps two years before it will granulate. Other honey will granulate in one month.

Q. Isn't it desirable to prevent granulation?—A. Yes, it is, but for only one purpose, I think, and that is for the grocer. People feel when honey is granulated that it is sugar. And another reason is that they like to have it liquid because it looks better in the glass—for the sake of appearances.

Q. You say there is nothing used to prevent that granulation?—A. I think not to any extent, at least. It would be very desirable—

Q. To any extent?—A. Not that I know of. It has been said that putting a certain proportion of water into pure honey will prevent its granulating, but of course that is an adulteration, the same as putting water in milk, although not harmful.

Q. (Referring to certain samples produced by the witness.) These are samples of honey which are supposed to have glucose mixed with it?—A. Yes, sir. Here [indicating] is one which has a piece of comb in it, and although I have tasted it, yet I imagine it is nearly all glucose with a piece of comb. The price is another item which gives it away. We paid 8 cents for that sample [indicating], while the pure honey would retail at 15 cents.

Q. Of course the public can not judge, because they do not know what the proper price of pure honey is.—A. That is very true.

Q. Where is a sample of pure honey, absolutely pure?—A. (Producing a sample.) I will guarantee that tin-topped jar as being absolutely pure. I put that up myself.

Q. What percentage of glucose do you suppose is in that [referring to another sample], or have you any means of knowing?—A. No, I have not; only I have the statement from one of the adulterators here in the city, who says he puts in one-eighth honey and the balance glucose.

Q. That is glucose adulterated with honey?—A. It should be sold as glucose instead of honey. We find that nearly all of the large wholesale groceries in this city, and in other cities also, adulterate it. In fact, I have found adulterated articles in the line of honey from St. Louis. At the fair one time I found it—nearly all glucose, with comb honey put into it.

Q. You think the interests of the consumers of pure honey and of the producers of pure honey would be properly protected simply by a law which would require labeling?—A. I have no doubt of it. That is what we are working for in the bee-keeping associations and also in our publications.

Chief Chemist WILEY. I would like to ask Mr. York in regard to the piece of comb. I see you have a piece of it there.—A. Yes, sir.

Q. Of what is that made?—A. The comb foundation is made out of pure beeswax. It is melted and dipped on boards and then peeled off the boards in sheets and run through rollers, and that forms the basis of the cells. You see on each side the same shape of the cells. And this is put into the center of the empty box and then put in the hive, and the bees draw out this comb, lengthen the cells and add more wax to it, and then it is sealed over after being filled.

Senator HARRIS. It serves as a foundation for the bees to work on?

Answer. It serves as a foundation for the bees to build the comb straight, and also to fasten it around the edge so as to help in shipping. If that were not so well fastened around the edges of the box, it would break down in shipping.

Q. That is made of absolutely pure beeswax?—A. Absolutely pure beeswax.

Q. The same substance which the bee would use?—A. Yes, sir. They have experimented with paraffin and other wax, but they find it will not do because the heat of the hive melts it down. This (beeswax) melts at a higher degree of temperature.

Q. Does your observation indicate that the bee would exercise any discrimination; that is, that the bee would object to working upon a foundation of paraffin?—A. Yes; on paraffin and ceresin both. They do not take to it as well as they do to the natural wax.

Q. They recognize it as something foreign?—A. Yes, sir.

Chief Chemist WILEY. Are you acquainted with any proposed mechanical appliances, for instance, patents which claim to be able to build up the entire cells?

Answer. I brought this sample purposely to show the extent to which they have arrived in making the depth of the cell. This is the deepest they make to-day. This is called the thin-base foundation, from A. R. Rowe & Co., and this is the deepest cell they make to-day. Last year they made something deeper, nearly half an inch, I think; but that was not a success, and they have abandoned it entirely. They lost \$2,000 in their experiments.

Q. You think it is mechanically impossible to make a deep cell?—A. Yes, sir; I do. There has been an offer of \$1,000 standing for about fifteen years to anyone who will produce one pound of comb honey without the intervention of a base, and that offer has not yet been taken.

Q. Do you think it is possible to make a comb which sufficiently resembles the natural comb to be put into a jar with glucose so as to make people believe it to be the natural comb?—A. Yes; I believe a person who was not acquainted with the manufacture of comb might be deceived about it; but they can not make the cells nearly the depth of the natural comb.

Q. But you think that the artificial comb might be dropped into one of these bottles so as to deceive a customer into thinking it was the natural comb?—A. I presume if they cut them up and put them into a bottle it might deceive customers.

Senator HARRIS. Just at that point. Would it be commercially profitable, do you think? Would the expense of manufacturing the comb compare with the cost of the natural comb?

Answer. Oh, yes; I think so, so long as they would not have to seal it.

Chief Chemist WILEY. They would not need to in a case of that kind?

Answer. No, sir; they would not need to. That is not very expen-

sive. I think that retails at 75 cents a pound, and there are 10 or 12 square feet in a pound.

Chief Chemist WILEY. I have opened many bottles which have been covered in, and the comb seemed to be fragmentary.

The WITNESS. What was the depth of the cell?

Chief Chemist WILEY. Sometimes half an inch deep and sometimes shorter, and frequently floating around, broken-up cells. I could not say that those were artificial, and yet I have often suspected that they were made of artificial material and were not the genuine cells.

The WITNESS. I am acquainted somewhat with the dealers on the streets in Chicago, who handle honey in large quantities, and they very often get in comb honey that is unsealed, partly sealed, etc., and they nearly always sell it to the adulterators, to be cut up and put into these jars. It is almost the full-depth cell, but unsealed. I was in a grocery store yesterday, where I saw on the shelf seven or eight of these boxes, and I presume they were not ever sealed. They sell a good deal of that to the adulterators.

Q. Those were taken from the hive before the bees had completed their work?—A. Yes, sir. It should never have been sent to the market in that condition.

Q. Mr. York, what would be your definition of pure honey?—A. I ought to be ready for that. Pure honey is the nectar of flowers, gathered by the bees and stored in combs made by them. There must be a transformation in there.

Q. Would you exclude strained honey from that definition? Such honey as you show there?—A. From pure honey?

Q. Yes; would you make a distinction?—A. No; that is the same honey, except it is out of the comb. It is combless honey.

Q. Extracted?—A. Extracted. It is honey the same as the other, except it is out of the comb.

Q. Is it customary for bee growers to feed sugar or sirup to bees?—A. It is for the purpose of keeping them alive, but not to any extent for the purpose of producing honey.

Q. If honey were produced by feeding sugar or sirup to bees, would you regard that as true honey?—A. I would not. That is simply getting the bees to adulterate, instead of the people doing it themselves. I should so regard it. But I think that is practiced so little that it really has very little bearing on the crop as produced; but of course they do feed sugar for the purpose of wintering the bees, in case of a very poor season. In the fall of the year they will feed them to carry them through the winter; and of course some have fed sugar to produce honey, but it is not profitable, on account of the expense of the sugar, for one thing, and then the waste in transforming.

Q. Do you know anything about honey made from pine trees?—A. I do not. I never had a sample of it, nor heard of it, I think.

Q. Called pine-tree honey?—A. I never have heard of it.

Q. Do you know anything about the honey made from the wild sage?—A. California sage?

Q. Yes.—A. I have had samples of that; yes, sir.

Senator HARRIS. Sage brush?

Answer. Sage brush.

Chief Chemist WILEY. Does that differ from honey made from white clover in any respect except color?

Answer. And flavor.

Q. It has a flavor which is different?—A. It has a very different flavor.

Q. In chemical properties, do you know whether there is any difference?—A. I could not answer that. I have never analyzed it. There is one jar here [indicating a sample]. Here is a jar which has on it the words "California White Clover Honey." Anyone who is familiar at all with the honey produced in different States would know at once that this honey never saw California. They do not produce white-clover honey in California. At least I have never heard of a pound being shipped out of that State. White clover may grow there, but so far as we know it does not secrete sufficient nectar to feed the bees. So that label, to anyone who knows, would be a fraud upon the face of it. That is put up by a city firm here.—"California White Clover Honey."

Chief Chemist WILEY. I would like to state, for the benefit of the committee, that I have analyzed many hundreds of samples of bees' honeys, and that a very large percentage—I could not exactly state how much, but an enormous percentage—of the strained honeys are adulterated honeys. At least, when I made my examination several years ago it was the exception and not the rule to find a pure honey in the strained form in the open market.

The WITNESS. That is very true.

Chief Chemist WILEY. And especially the circumstance which I mention, of a piece of comb found in a jar of this kind. I never found a sample of that kind of honey that was genuine. The existence of a piece of comb in a jar like that would be positive proof to me that it was an adulterated article, because comb honey is not sold that way. These combs are never perfect that we find inside of these jars. They have the appearance of either having been broken down mechanically, as in the process of extraction by centrifugal force, and then those empty combs put in, or of having been made artificially and dropped in. They are simply fragmentary combs.

Senator HARRIS. It is a case of protesting too much.

Chief Chemist WILEY. It is really positive proof of adulteration to see one of these pieces of comb in a jar.

The WITNESS. And one reason for the positiveness of that is that bee keepers themselves never put up honey in that way. It is nearly always done by the adulterators themselves. Bee keepers do not sell their honey in a glass with a piece of comb in it.

Chief Chemist WILEY. What is the objection of selling all honey in the comb?

Answer. One great objection is the fact of its granulating so soon; and after honey has once granulated in the comb the only thing that can be done with it is to eat it in that form, or melt it up and extract the wax and get the extracted honey. But it is almost impossible to retail granulated comb honey; I tried that here in the city.

Q. Is it difficult to retail extract honey?—A. It is, for the reason that people think it is sugar; but as soon as they learn that all pure honey will granulate they will never buy the liquid. They are certain of getting the pure honey in the granulated form.

Q. Mr. York, do you know of any adulteration of honey with invert sugar?—A. I do not. I think that glucose is almost the only adulterant used with honey.

Chief Chemist WILEY. In this country I think that is quite true, that glucose is practically the only adulterant used. In Europe, where the laws are more stringent, invert sugar has been very largely used for adulterating honey. This makes the problem of the chemist very much more difficult.

Senator HARRIS. What is invert sugar?

Chief Chemist WILEY. Invert sugar is ordinary sugar, such as we use on our tables, which is treated with an acid which converts it into a mixture of dextrose and lebulose, and that is almost the exact composition of natural honey. The nectar of flowers is originally common sugar.

Senator HARRIS. It is decomposed?

Chief Chemist WILEY. It is a hydrolysis, a decomposition, and by natural processes and by the action of the organism of the bee the sugar in the nectar is converted into invert sugar and deposited by the bee in that form, so that natural sugar contains at most only a trace, or 2 or 3 per cent—natural honey, I should say, contains at most only a trace, or 2 or 3 per cent, of cane sugar. The kind of honey I spoke of a moment ago as having been formed by feeding bees sugar sirup, the bees are not able to invert the whole of it, and all such honey shows a large percentage of cane sugar, so that it is easily detected by the chemist.

The WITNESS. I am glad to know that.

Chief Chemist WILEY. He will detect it as easily as glucose honey is detected. Natural honey, when examined by the polariscope, always shows a left-handed rotation. It rotates the plane of polarization to the left. Cane sugar and glucose both rotate the plane of polarization to the right. So that a simple examination with the polariscope will show sufficiently to distinguish an impure from a pure honey. There is a honey, however, gathered from the pine tree, which, according to the definition given, which I consider a just one—it is a nectar gathered from plants by bees—which is a right-handed honey, and in the courts sometimes it has been claimed, in cases of prosecution for adulteration, that the right-hand polarization has been due to the gathering of the honey from the pine trees. This honey often only exudes at one season of the year—in the climate of North Carolina, say, in May—and is only gathered in a very short time and to a very limited extent, and has a very rank taste, so that it is not fit to use. And the taste will show people how to distinguish, where a claim of that kind is made, that that is the only honey which contains cane sugar. I never have had in all my experience but one sample of pine-tree honey out of thousands of samples.

The WITNESS. It is surprising that I have never seen a sample.

Chief Chemist WILEY. I do not suppose it ever reaches this far.

The WITNESS. No. I would like to ask, Professor, if I may, whether glucose, as used in honey adulterated, is injurious to the system?

Chief Chemist WILEY. That is a question that has been pretty well discussed before the committee already, and I have already expressed my opinion in former testimony.

The WITNESS. All right.

Chief Chemist WILEY. You think that a national law regulating commerce between the States in adulterated honeys would be beneficial to the bee keeper?

Answer. I do think it would.

Q. Do you think it has ever been the practice among the bee keepers themselves to adulterate their honey before bringing it to market?—A. I do not. I think I never knew of but one bee keeper who was accused of adulterating honey, in the fifteen years that I have known bee keepers. I think that was a clear case.

Q. You think the adulteration is entirely accomplished by the jobbers?—A. I do.

Q. And not by the retailers?—A. I think not; for the reason that the retailers seldom put up the honey in glasses. It is nearly always the wholesale grocers.

Q. You are quite positive that the general opinion, which is the true one, that honey is adulterated, has hurt the sale of all kinds of honey?—A. I am very sure of it, for the reason that when a person buys this adulterated stuff and once tastes it, he says, "If that is honey, I don't want any more of it;" and a doctor friend of mine, when I first met him, said he could not eat honey; that it always made him sick. I said, "You have never had any pure honey," and I gave him some honey which I knew was pure, and he ate it right along, and it never hurt him at all.

Chief Chemist WILEY. Pure honey sometimes produces nausea.

Answer. Sometimes.

Senator HARRIS. Pure honey sometimes produces eruptions of the skin, does it not?

Chief Chemist WILEY. There are some forms of honey which are absolutely poisonous to some people.

The WITNESS. From the mountain laurel, I believe. Where we find that it is injurious to the stomach, we advise the use of milk in connection with it, and it helps to overcome the effect.

Senator HARRIS. I believe that is all, Mr. York, unless you have something special to which you wish to call the attention of the committee.

The WITNESS. I think there is nothing further, only I hope the result will be a national pure-food law which will cover all these frauds.

STATEMENT OF MRS. N. L. STOWE.

Mrs. N. L. STOWE, being duly sworn, testified as follows:

Senator HARRIS. Please give your name, Mrs. Stowe.

Answer. Mrs. N. L. Stowe.

Q. Your residence.—A. Evanston, Ill.

Q. And your occupation.—A. I call myself a bee keeper, but I am really a home keeper.

Mr. MOORE. She has kept 80 swarms of bees, and we think she is one of the most celebrated lady bee keepers in this country.

Senator HARRIS. I should think that would be sufficient to establish it as an occupation.

Q. Mrs. Stowe, the committee will be very glad to hear what you can tell us with reference to the adulteration of honey and the imposing upon the public by substitutes and things of that kind.—A. I don't know that I can tell anything more than has been said, but I should indorse all that Mr. York has said.

Q. You fully agree with his statements?—A. I do; yes.

Q. As to the manner and extent to which honey is adulterated?—A. I do. I think it does great harm to the bee-keeping fraternity.

Q. As well as being a fraud upon the public?—A. Yes. It may be all right to sell that stuff if they call it glucose, or a mixture, but I think it is a harm to us to have it labeled "honey."

Q. You have no knowledge of bee keepers adulterating honey?—A. I have none at all.

Q. You think with Mr. York that it is done by the jobbers principally?—A. I think it is. I don't think it is done by the retail mer-

chants; but I think there are firms in Chicago that make a business of adulterating honey.

Q. You think with Mr. York that a law to compel these mixtures to be labeled would be a sufficient protection? It would enable people to distinguish the true from the false?—A. I should think so.

Chief Chemist WILEY. Do you ever feed your bees any artificial food, Mrs. Stowe?—A. No; I do not.

Q. Not even during the winter or early spring?—A. I have always been able to have my bees gather enough in the fall to keep them through the winter. I have never been obliged to feed. Some do have to feed their bees to winter them over, when they take too much of the surplus from them in the summer and fall; but I have never done that.

Q. Do you use a comb foundation in your hives?—A. I do.

Q. Such as has been described here?—A. Yes, sir.

Q. You do not consider that an adulteration if made of pure beeswax?—A. No; I do not.

Q. Do you think it is ever made of a mixture of paraffin and beeswax or ceresin?—A. I don't think it would work well in a hive if it was. Paraffin melts too easily; it is not strong enough.

Q. You do know, though, that many attempts have been made to make this adulteration, do you not?—A. I have read that it has been tried, but that it does not prove satisfactory.

Senator HARRIS. I do not think of anything else, Mrs. Stowe. We are very much obliged to you for helping us in this matter.

STATEMENT OF HERMAN F. MOORE.

HERMAN F. MOORE, being duly sworn, testified as follows, in response to questions by Senator Harris:

Senator HARRIS. Please give your name, address, and occupation.

Answer. Herman F. Moore, Park Ridge, Ill. We are a family of bee keepers. Our folks have kept bees for about thirty years, and I personally have been connected with the business for close to fifteen years.

Q. Have you any other occupation? Have you any connection with the bee keepers as a whole?—A. I am secretary and treasurer of the local organization, the Chicago Bee Keepers' Association, and am also a member of the national organization of bee keepers, called now United States Bee Keepers' Association, which is national in character, and one of whose objects is expressly the prevention of the adulteration of honey, or, I should say, the fraudulent adulteration of honey.

Q. Have you anything that you can bring to the attention of the committee in that direction?—A. It is a little hard to add anything after Mr. York's testimony, because he pretty nearly covered the case. I do not recall anything that he said but what I would have to say "yes" to.

Q. You fully indorse all the statements that he has made?—A. Yes. One of the first things that came to my notice years ago, when I first began to sell honey to the public, was that a piece of comb honey in liquid honey was a badge of fraud, a thing that bee keepers never practiced.

Q. That is a practice of the men who adulterate?—A. Yes, sir. It is in the nature of a deception. I would like to make a remark here

that perhaps would cause some good. Professor Wiley has raised the question about the manufacture of comb honey. That is a question which we have fought very hard, for several reasons. I tell my friends and customers that it is mechanically and commercially impossible; mechanically impossible that a man can make beeswax that will satisfy the man who chews it in his mouth. He will not make it clean enough or light enough; and it is commercially impossible because the bees work cheaper than man can, even with the very finest machinery or the cheapest labor. You must remember that in a very favored locality, with a large number of bees and a man who is expert in the business, comb honey can be raised for 2 or 3 cents a pound. For instance, Cuba. I mean the cost to the bee keeper who is established, and in countries where there is from ten to twelve months each year in which honey can be raised.

Q. To what extent does that apply to this foundation?—A. Well, the foundation has nothing to do with this point. The foundation is simply an aid to the bees, and the great reason for using a foundation, as I see it, is that our honey crop is short from one to two or three months, and if the bees spend part of the time building comb they lose part of the crop. It is an aid to the bees.

Q. You say that the comb can not be imitated so as to be satisfactory to the person who chews it? This foundation can be made?—A. That is one of the points right here, Senator, that I wish to make. The largest use of this comb foundation is in what is known to bee keepers as the board department of the hive. The public must understand that in order to understand intelligently this question. To-day bee hives are composed of two structures. The board department is perhaps a foot high, and then the upper frame, which would naturally, if you are raising comb honey, be half that height; and the comb foundation is more largely used; I should say 9 pounds of it is used in the permanent part of the hive to 1 pound that is used in the surplus or pound sections. I will have to go a little further so you will understand it thoroughly. The comb foundation used in the board department may be used for fifteen or twenty years. We never destroy it. The bees fill it with young bees and honey year after year, and we keep it as long as it will hold together, and we keep the bees, which you see leaves the cost to us almost nothing as compared with these benefits.

Q. I understood Mr. York to say that it was used in cases which were to be taken out and sold because it guided the bees and made a more perfect and symmetrical comb and better attachment to the frame.—A. That is correct, but I believe the percentage of bee keepers who use it in the 1-pound sections is very small as compared with the others. And I advise never to use it in those, because I find the public is superstitious. They often ask me: "Did the bees make all of that?" I say, "Yes, sir." I believe they make nine-tenths of it, because in one-tenth they use the foundation, and in the other nine-tenths the bees have done the whole operation; and they clearly object to eating anything that man has made, even though it is as clean and pure as this comb foundation is. They want the comb honey, and they want it entirely the act of the bees.

Q. Anything artificial brings in at once suspicion.—A. Yes, sir; that is clearly the point. I have sold to the public in the retail trade for twelve or thirteen years at least.

Chief Chemist WILEY. What do you think the effect of the sale of these spurious honeys has upon the price of the genuine article?

Answer. Well, Professor, that is the very hardest question you could have asked. I will have to make a statement in order to cover it. The effect of bad honey in the stores is this: The man who buys it will eat a little of it and throw it away and stop buying altogether from the stores. He has a prejudice against it and thinks he can not buy any good honey at all and stops buying honey. Just what the effect of that would be on the sale of honey, whether it would throw a lot of it back on the bee keepers' hands, and thereby lower the price, or whether it would raise the price—it would clearly raise the price of honey in the hands of accredited parties, parties who could sell it with a certain amount of their own individual faith with their goods.

Q. Do you approve of the process of extracting honey for the trade?—A. Professor Wiley, that is a question that we have not anything to do with. The trade asks for liquid honey, nine-tenths of it. Cake baker's and candy makers and roach-poison makers and druggists and private families, nine-tenths of them, require liquid honey without the comb.

Q. Don't you think people prefer comb honey for table use?—A. They do not, Professor. My trade for twelve or thirteen years has been with families, and the trade is nine-tenths of it in liquid honey, if they understand that it is always pure honey, as ours has always been.

Q. Isn't that largely because liquid honey is cheaper?—A. I have sold the two at the same price uniformly.

Q. They prefer the liquid?—A. Uniformly. I have sold the two at the same price. They say, "Here is a loss of 15 per cent."

Q. That is sold in as weight for honey, is it?—A. That by custom is called honey, the whole of it, and it costs the bee man more than the liquid honey, and consequently it is perfectly right that it should, as a matter of reason. When we extract the honey, we take a thin sheet of wax from the top or the walls on both sides. That is put in a centrifugal machine, which whirls it rapidly or slowly, as you please, and the honey is thrown out by centrifugal motion. The wood protects the wax, and there is the ready-made honey pocket that the bees fill at once, and you never need to build it again as long as you keep bees.

Senator HARRIS. The cost of extraction is more than repaid by retaining the frame and the foundation in that way?

Answer. Yes, sir; I should consider that its being used over and over again is worth 75 cents a pound, and the honey, I take it, they may get perhaps 25 cents a pound for.

Q. And the producer would rather sell liquid honey?—A. Yes; it is a more scientific act to raise comb honey than liquid honey; much more so. It takes more experience, and you can pretty nearly duplicate the yield of honey from the serum of bees by extracting it and returning the empty comb to be refilled, which would be done several times a season if the honey is in the flowers.

Chief Chemist WILEY. How often can good comb, with a good foundation in the center, be extracted without destroying it as a comb—how many times?

Answer. It can be used twenty-five or thirty times.

Q. Right along?—A. Yes. Wood catches all the knocks; and the bees have fastened it so permanently and firmly to the wood that the wax itself gets no particular strain.

Q. You extract one side at a time?—A. Yes; because the inner side does not have the whirling motion. It must be reversed.

Q. You think a law regulating interstate commerce in adulterated honeys would be beneficial to the bee keepers?—A. I do not put it, Professor, on such a narrow ground as that. I think we are one great people and must stand or fall together. I say a law which prevents a fraud upon the one who eats the honey will benefit everybody. It will benefit you, if you buy honey to make cough sirup for your baby, that you will not get any bad ingredient. It will benefit the bee keeper, in that people will believe when honey is sold as honey that it is honey. I think it will be clearly beneficial to everybody.

Senator HARRIS. You think that it would increase the demand for pure honey and decrease the demand for adulterated honey?

Answer. I think clearly so. I think anything sold under false colors—I think honey sold under its true colors—adulterated honey sold under its true colors would not sell at all.

Q. Even although the cost of the pure honey would be considerably greater than that of the adulterated?—A. I consider, Senator, that it would cut off the sale 75 or 80 per cent if it was sold under its true colors, the adulterated goods.

Q. That it is not altogether a matter of cheapness that controls people in buying it?—A. I think not.

Q. A great many substitutes are recommended, because it is said that it brings a particularly good article within the power of the poorer classes to purchase. Don't you think that would have some effect, that argument would have some force, even in the matter of honey?—A. It would have some force, undoubtedly, but I feel sure that it would cut off the sale of adulterated honey, spurious honey, very much.

Q. It would at least be honest business.—A. It would be honest business, and that is the main thing after all. The people who buy this cheap honey are not the very smallest class at all. They tend toward the ignorant class, who do not look as carefully as some others would at the quality of their goods; and if they see a label on the outside which says "pure honey," they are apt to take it.

Senator HARRIS. I believe that is all.

The WITNESS. One thing I wanted to add. Professor Wiley asked about comb honey being used in jars. There are hundreds of thousands of these little sections which are not well filled which get into the hands of the bee keepers, and also which have gotten to market from some bee keeper who was not up to date. No up-to-date bee keeper sends honey to market which is not nicely kept. So that there would be hundreds of thousands of bees' sections with no capping on them, if they chose to go out and hunt them up, for the uses of the fraudulent honey bottlers.

STATEMENT OF GEORGE M. STERNE.

GEORGE M. STERNE, being duly sworn, testifies as follows:

Examination by Senator HARRIS:

Q. Please give your name.—A. George M. Sterne.

Q. What is your occupation?—A. On the board of trade. In the commission business.

Q. You handle quantities of all sorts of food products?—A. A good deal; yes, sir.

Q. Of course, Mr. Sterne, you understand the objects of this committee?—A. No; I do not exactly, Senator.

Q. In brief, it is simply to endeavor to ascertain fully and satisfactorily the extent to which adulteration is practiced, and not only adulteration as a whole, but in two aspects, one of which would simply be a fraud upon the purchaser, selling him a substitute which might be harmless, and the other selling him something which would be absolutely injurious to the health of the purchaser if consumed. Now, we would be glad—of course, you have had an opportunity to see a good deal of this adulteration, if it is done, or to come in contact with it in various ways, and if you can give us information in that direction it would be a public benefit.—A. I was prompted to come down to see the committee from some articles I read in the papers day before yesterday in connection with oleomargarine. I have been connected with the business since its beginning, in 1879, in this country; and I noticed there were some witnesses who testified in reference to oleomargarine, and none of the evidence given was what I thought the committee ought to have in connection with that product; and there were witnesses here who could have testified in connection with the butter business, and they gave no evidence in connection with that at all, and I thought the information I had in hand ought to at least be brought before the committee, so that people who are engaged in that business could also be subpoenaed to come here and tell what they know and what they are doing about the washing of what we call gangrened butter. I know of a number of firms who are supposed to be in that business, and if the members were brought here they could tell what they are doing in the matter.

We began to make oleomargarine in 1879, and it is made to-day almost identically as it was at that time, out of absolutely the purest fats there are in the world; and while I have gotten out of the business and have no interest in the business at all, I have always been an enthusiast in the production of oleomargarine. Professor Wiley will tell you that all through the examinations by the chemists and microscopists of the Government I have furnished them samples of all the fats they desired, and have done it with a great deal of enthusiasm, and have given them just exactly the products they were using, and was interested in the objection to the passage of a law placing a 2-cent tax upon oleomargarine. I learned that one of the witnesses the other day, who is the editor of a paper which I see lying upon the table here, is making a very aggressive, as he supposes, warfare, and inducing people throughout the country to put up money and get a bicycle or a prize for the advancement of the tax to 10 cents a pound; and my object in coming here is to explain why oleomargarine is, next to one food, and that is honey, and probably rice—speaking of pure honey and rice—the purest food product in the world. There is nothing purer than oleomargarine.

Q. In the manufacture of oleomargarine there is nothing that comes under the head of adulteration?—A. Absolutely nothing; it has no adulteration in it whatever.

Q. It is manufactured as a compound of butter and oleomargarine occasionally, is it not, or frequently?—A. That is not the way we put it at all. No oleomargarine maker to-day uses any butter.

Senator HARRIS. That I should be glad to know. I had understood that butter was used in the manufacture of oleomargarine.

Answer. In this way: We take the butter fat from the bullock, just as it comes from the same feed, the same grass, the same everything

that the cow feeds on. Those fats are taken and processed only to the extent that they are cooked; that the tallow element, as we call it, is withdrawn from it, taken out by an entirely mechanical process which leaves the butter fat absolutely, as far as chemistry has been able to determine, the same butter fat that is produced by the milk of the cow, and is far superior, for the reason that there is no deterioration from the time the fat is placed within the hand of the mechanic to work upon it through the process of producing butter, while the butter fat begins to deteriorate at once from the time it leaves the udder of the cow until it is placed on the market. That is evidenced most strongly by every butter man who takes an exhibit to the fair. He insists upon judgment within twenty-four hours after he places his butter on the table. If he does not get judgment on his butter or get his ribbon within twenty-four hours, he insists that the butter was not judged properly. Therefore the deterioration takes place at once.

Q. You assert that there is butter produced and churned in with this butter fat which is artificially obtained?—A. No, sir; they use cream. The cream is bought and used as cream.

Q. And churned in the butter?—A. Yes, sir; but with the entire fat, so that the butter and the cream and the butter fat which has been cooked has lost its aroma, which is caused by the action of the bacteria that are in the milk; the breaking down of the milk, starting with the cream, is necessary to extract the butter. The oleomargarine maker takes the cream and churns it with his butter fat, which he has cooked, and gives it that aroma from the cream.

Q. He does not buy the butters and mix them?—A. Not a pound. But the fats, both the neutral and the oleo, have been cooked. That is the great objection made by the butter people to oleomargarine, is its keeping qualities. Its purity has been extolled by everybody who has tasted it.

Q. Of course, the pure article is not under discussion. It is the question of adulteration that we are getting at—of mixtures which are palmed off upon an unsuspecting and ignorant public.—A. I am here to assert that oleomargarine is not adulterated.

Q. And that there is no process by which butter, either good, bad, or indifferent, is produced and brought in and worked over and mixed with the oleomargarine, but that the mixture which is used, of the butter fats, is by way of cream, churned?—A. Absolutely rich cream.

Q. (Continuing.) And the mixture is brought about in that way?—A. Yes; but as the committee is here to benefit the health of the public and to prevent fraud in the sale of these products, I am anxious that they shall get the facts without any bias or prejudice in favor of an article so pure as oleomargarine. The Scientific American makes the statement—I will read a few lines of it—in which they say:

In everyday life butter is very essential. Its free use by sufferers from wasting diseases is to be encouraged to the utmost, in so far as it can be borne. All this seems very simple, but, unfortunately, an excess of butter diet, even in a healthy organism, is likely to give rise to butyric dyspepsia, and butyric fermentation is set up largely through the presence of a ferment, a residuum left by the butter-milk.

Considering the foregoing, it seems strange that oleomargarine has not been thought of as a palatable and suitable article of diet for those suffering from wasting diseases. It is free from all objections, despite the idle and malicious tales spread by parties interested in securing higher prices for inferior and unwholesome products. Were the truth fully realized by all classes, bad butter would find no

market; but, unfortunately, the majority of the people have no comprehensive idea as to what oleomargarine practically is.

The resulting product, as a matter of fact, is a better and purer butter than nine-tenths of the dairy product that is marketed, and one that is far more easily preserved. There are a large number also who imagine that oleomargarine is made from any old scraps of grease, regardless of age or cleanliness, which is quite the reverse of the fact; indeed, a good "oleo" can only be had by employing the very best and freshest of fat. This "artificial butter" is as purely wholesome (and perhaps even better as food) as the best dairy or creamery product.

The official chemists for the Austrian Government say that the only germs ever present in oleomargarine are those which are common to air and water. They also found that the product is especially liable to contamination, inasmuch as the best process of manufacture fails to eliminate all the lactic-acid ferment.

Senator HARRIS. Now, Mr. Sterne, tell about the use of coloring matter.

Answer. Annatto, the coloring matter that is advertised on the back of that butter paper [indicating], is the principal butter color used by a number of color makers. That paper is the Chicago Dairy Produce Journal. You will find the advertisement on the front page, Senator. It is the same coloring matter that is used in butter.

Q. What is the composition of this coloring matter?—A. Annatto, a base of either linseed or olive or cotton-seed oil.

Q. None of the aniline dyes?—A. Not an atom in butterine.

Q. We have a great deal of evidence here to the effect that aniline dyes were more or less crowding annatto and dyes of that character.—A. Not an atom in the oleomargarine business.

Q. Do you speak for the whole oleomargarine business?—A. I know pretty much all about it. There is nobody using any such color. No aniline dyes are used. I defy proof.

Senator HARRIS. We have had some very strong evidence to that effect from expert chemists. I am not speaking of it as applying especially to oleomargarine or especially to butter, but I mean as a coloring matter.

Answer. Oh, that may be so. I am only speaking now about butter facts. I don't know whether the butter or oleomargarine men are using any annotto. Have you ever found any, Professor?

Chief Chemist WILEY. I think you are wrong. I think they do not use any annotto at all. Nor do butter makers at the present time use any annotto. It has gone practically out of use. This same firm that you quote used to make annotto exclusively, and they told me not long ago, one of the firm did, that they had almost absolutely stopped making it, and that there is no demand for it either from butter makers or from oleomargarine makers.

Senator HARRIS. The evidence has been almost overwhelming, even from the butter men themselves, practically admitting the superiority of the color obtained by the aniline colors.

The WITNESS. I don't believe it.

Senator HARRIS. What is the object, Mr. Sterne, of coloring oleomargarine?

Answer. For the same reason that the butter people do, to make it—this paper describes in an article that the man who makes his butter best and who makes it most attractive to the eye sells it at the highest price.

Q. Some colors are more attractive than other colors. Is not the use of this particular color attractive because it resembles the highest grade of butter?—A. Not particularly so. It does not resemble the highest grade of butter.

Q. What is called "June butter" is a very yellow butter. That is supposed to be a more fragrant and desirable butter, is it not?—A. If that is so, Senator, why do all the butter makers use butter coloring the year round?

Senator HARRIS. I do not think there is any question as to the motive being the same in each case, so far as my own opinion is concerned.

The WITNESS. I think so.

Senator HARRIS. And I am merely asking you for the motive in your mind.

Answer. That is the idea, to make it attractive to the eye.

Q. And to make it resemble a superior class of butter?—A. Because everybody has become familiar—and the popular butter is a bright yellow color—and the more perfectly yellow the butter and butterine makers make theirs the quicker it is sold.

Q. The maker of inferior or white butter colors what is butter in order to make it resemble a superior grade of butter?—A. You manufacture something which is chemically the same, perhaps, as butter, but which is not butter, but you color it in order that it shall resemble butter. President Chandler, president of the board of health in New York, declares that it is butter.

Q. I only want to know if my deduction as to the use of colors is fair and correct.—A. That is right.

Q. Of course, if aniline dyes are used by either the butter or oleomargarine maker, that you would regard as injurious?—A. Yes, sir.

Q. And should be prohibited?—A. Yes, sir.

Q. A natural vegetable color like annatto, so far as its effect upon the health is concerned, would be one which would be harmless?—A. Harmless.

Q. What would you think of a law which would absolutely prohibit the use of coloring matter in either butter or oleomargarine? Would it be beneficial?—A. No, sir.

Q. Would it be injurious?—A. It would not be injurious to health, but it would hurt the trade both of the butter and of the oleomargarine people.

Q. Why would it hurt the trade if both parties to this controversy were prohibited from coloring their product?—A. I can see how it would hurt the sale of both products.

Q. It would only hurt the sale of something which was inferior to that which is accepted as the standard in color.—A. Have you any idea how much of the butter is standard in color?

Q. It may not be but an infinitesimal part, so far as that is concerned; but that is a fact, nevertheless, is it not?—A. Yes; that is a fact. Have you seen the oil from which oleomargarine is made in its natural color?

Q. No, I have not. I want to get at this question of coloring, Mr. Sterne, if you will pardon me for a moment. Why would it affect—if everything was put upon the absolute basis of unsophisticated appearance, where would be the harm?—A. The harm would come greater to the butter people than to the oleomargarine.

Q. You are not looking out particularly for the butter people?—A. Not particularly; still I am honest in what I say.

Senator HARRIS. Yes, I think so, Mr. Sterne. I give you credit for that; but as there is a great claim of deception made by various parties and all that, don't you think that perhaps the best way would be for both parties to lay aside all appearance of deception?

Answer. No, not so long as there is no harm in the coloring of the products. I don't think there would be any good. I think that would be a waste of time. If people want yellow butter, let them have it.

Q. Certainly, if they want yellow butter; but suppose they want yellow butter and ask for oleomargarine?—A. Suppose they ask for yellow oleomargarine?

Q. Do they ever ask for that?—A. No, they do not. They ask for oleomargarine.

Q. For oleomargarine?—A. Yes.

Q. People are becoming educated up to the point of the article in the Scientific American where they recognize the merits?—A. In the district where I live there are thirty-five grocery stores, every one of which has a sign upon a box in the store, a sign in front of the store, and glass or brass signs hung about, "Try Moxley's butterine;" "Braun & Fitts's Holstein," etc.

Q. Braun & Fitts's Holstein?—A. Yes, sir. That is Braun & Fitts's popular butterine—Holstein.

Q. What could you imagine the purpose of using the name of a breed of dairy cattle as the name of this kind of an article except deception?—A. If he says "Holstein oleomargarine"—

Q. Does he say that?—A. Why, surely. "Try Braun & Fitts's Holstein oleomargarine." There are boxes with a great big sign—oleomargarine signs—on top of them.

Q. Does that mean that the essential oil is taken from Holstein?—A. Yes, sir.

Q. (Continuing) that it is taken from Holstein cattle?—A. That is the idea. Just as a man says "Our fine Jersey butter," made from common cattle.

Q. Jersey butter is the product of cream produced from Jersey cows?—A. Yes.

Q. This would be tallow produced by Holstein cows?—A. Yes, sir.

Q. Don't you know, as a practical cattle man, that Holstein cattle secrete and make less tallow than any other breed of cattle known?—A. I don't know anything about that; no. I know that the Holstein cow gives more milk than almost any other cow.

Q. And for that reason she has less tallow.—A. But we do not take tallow from cows. We take the tallow from the bullock.

Q. The same characteristics, of course, of the cow extend to the steer?—A. Certainly.

Q. And the steer is the heaviest feeding animal that we find in our cattle yards. It takes more feed to produce tallow. The point is that the use of that name would not indicate that the tallow came from Holstein cattle, because they are comparatively scarce in proportion to other cattle?—A. I don't see what difference it makes as long as the man calls it oleomargarine and stamps that word into the butter and onto the wrapper.

Q. As long as he undertakes no deception no criticism can be made.—A. There is practically no deception in the sale of oleomargarine among retail grocers.

Q. You think that retail grocers do fairly comply with the law which requires them to brand their packages on the paper and inform the public as to what they are purchasing?—A. Generally, yes. There are some people dishonest in every line of business, but, as a rule, now, as compared with ten or twelve years ago, when there were a whole lot of ugly laws and ugly enforcement of law and a whole lot of talk about snakes and grease and dirty stuff, then people could

not sell oleomargarine. To-day there are hundreds of people send to the factories and buy 10-pound packages of oleomargarine in the original package and send it home, but do not go to the grocery because of the fear that it will be found out that they are using oleomargarine.

Q. There was a witness testified that people came in and whispered that they wanted oleomargarine.—A. I expect that is right.

Q. Do you think there is still a prejudice existing?—A. Because of common talk. I have been out of the oleomargarine business for probably ten or eleven or twelve years—that is, out of the export manufacturing business—but I have had oleomargarine on my table every day since then. But it would not make any difference whose I bought, provided they made it of an acceptable grade and quality.

Q. As a commission merchant, you also handle butter, do you not?—A. No, sir.

Q. You do not handle any butter?—A. No, sir. Oh, I have an order for 50 boxes of butter once in a while. I simply turn it over to some one to fill.

Q. Have you any knowledge of the manufacture of this butter which is gathered up from all of the country stores, etc., and which is treated by what is known as the new process?—A. Yes, sir; it is known and recognized in the butter trade as process butter.

Q. What is your understanding of what process butter is; how it is made?—A. It is picked up on the street at the lowest price. It is green and moldy, and blue and white, and all sorts of colors. It is taken and put into a kettle and melted down and settled and put through a process of soda, rewashed, and handed out onto the table through ice water, put through a worker, recolored, resalted, and sold. I have examined it on Water street, where they put it up as imitation creamery.

Q. Branded as imitation creamery?—A. No, sir; not branded as imitation creamery, but it is known as imitation creamery in the cellar.

Q. Is there any specific mark by which it could be distinguished in any way?—A. No, sir; there are no specific marks on the butter in the cellars unless the man is trying to push his brand of butter.

Q. Do you know anything about antiseptics as a means of preserving butter?—A. I have never seen any used. I know antiseptics are bought and used by people on the street here. This paper quotes: "Imitation creamery is quiet. Sales are made at from 12½ to 13 cents." It shows there is a demand for it all the time by these people. This paper is a butter paper, published by Charles Y. Knight. This is dated May 6.

I do want to get at that washed butter, Senator. Nothing has ever been done about it since the oleomargarine law was passed to protect the public against this shoe-box butter.

Q. What you call "shoe-box butter," is it that mixed butter which is subjected to this new process?—A. Yes, sir. It is a shame that the public are allowed to buy and eat that product. It actually has enough alkali in it to take the throat out of a man.

Q. By the use of soda? You spoke of that.—A. Yes, sir.

Q. That is to say, for the purpose of correcting the odor and rancid taste?—A. The butter is absolutely unfit for anything except to settle salt. I have bought thousands of tons of it on the street and have shipped it for the settling of salt, for the elimination of certain products in salt. Then, there is this grease butter. That butter has

rarely been below 9 cents a pound, for the reason that the washers take it and reproduce it and put it on the street as a butter for food.

Q. You think to any appreciable extent?—A. To the extent of the entire street supply—thousands of tons a year.

Q. When you say the entire street supply—A. Of that kind of butter. It all goes into the hands of those people.

Q. How could that be prevented?—A. I really can not make any suggestions in that direction.

Q. What I am getting at is, would a law which would compel butter prepared in that way to be branded have any effect?—A. Yes, sir; that would probably affect it.

Q. Just to make it sail under its own colors.—A. Something should be done about that, and while I can not suggest the names of the people that are doing this, I could suggest the names of people who could probably tell who were doing it.

Senator HARRIS. I don't know that we would care for any names. We neither want to advertise anyone unfairly or injuriously in any way who is doing what is a legitimate business, of course.

Q. You think there are deleterious chemicals used in its preparation?—A. Yes, sir.

Q. What are they?—A. Sal soda, salicylic acid.

Q. Is that the result of analysis or of observation?—A. That is observation with me. I have not cared to make any expense to make a test of the product. I have thought of sending samples down to Washington to have them analyzed by Professor Wiley's department. In this connection I would like to read one little item in this paper—an offer from a Chicago dairy produce paper to give away 5 bicycles, the award to be made June 1.

(The witness here read the item referred to.)

Senator HARRIS. That is wholly irrelevant. The stenographer will strike that out. It has no relation to adulteration.

The WITNESS. I only want to present to the committee what Mr. Knight's idea is in the fight.

Senator HARRIS. Mr. Sterne, this committee has no sympathy nor feelings, one side or the other, in any fight at all. We are endeavoring to arrive at fairness and justice and right; and while there has undoubtedly been some biased testimony given, we propose to give everybody an equal show as to that, but without becoming in any way parties to it, nor, if possible, admitting any matter that is not relevant to the purpose.

The WITNESS. I only want to say that I believe, from my long experience in business, that oleomargarine has never had an adulterant, and has never had a fair chance to be known by the people, because of the objectionable articles in the press and in the dairy press. There was quite a fight on the mining prize. Everybody that subscribed a dollar got a share in the mine—

Senator HARRIS. So far as that struggle is concerned, you know that that has been the history of almost every valuable product either of the brain or of the hand of man. It has had to struggle up against the opposition of those interested in the existing condition of things.

The WITNESS. That is true, and oleomargarine got there because of its goodness and its quality.

Senator HARRIS. Those things necessarily work themselves out. We are very much obliged to you, Mr. Sterne, and appreciate what you have done.

The WITNESS. I wanted you to see original samples of the oleo oil and to show you how nearly a natural butter color it is.

(The witness here produced the sample referred to.)

Senator HARRIS. That is absolutely uncolored?

Answer. It never has had an ounce of coloring in it.

(The witness here produced certain other samples.)

There [indicating] is neutral lard. The medical fraternity say that that is absolutely pure. This is neutral lard.

Q. The product of the hog, as well as the product of the ox, is used?—A. Yes, sir; always. That gives the grain. This has a granular form in the process. That [indicating] is absolutely as pure as that [indicating]. There [indicating] is some of the finished product. It has the Government photograph on every package.

Q. This is a pure article, but it is in no way a component of natural butter?—A. Not at all; but a farm product, nevertheless.

Senator HARRIS. Yes; of course, a farm product. [Addressing Chief Chemist Wiley:] Is that odorless and tasteless?

Chief Chemist WILEY. Odorless and tasteless. It is neutral lard. The difference in the grades of oleomargarine is this—the quantity of milk and cream churned with each. The proportions of fats are nearly identically the same.

Q. The higher grade has the most cream churned in with it?—A. Yes; giving it naturally the greatest production of butter. The cream that is used is guaranteed on the contracts made by the oleomargarine people to churn 20 pounds of butter to 100 pounds of cream.

Q. Then the more nearly you can make it resemble butter, with the added keeping qualities, the better it is?—A. Yes.

Q. That is really the point in the whole thing?—A. Its purity and its keeping qualities are what make it valuable.

Q. The purity of production, its resemblance to a higher class of butter, and its keeping qualities?—A. Yes.

Q. That is the situation?—A. That is the idea exactly. There [producing a sample] is the cream which is used. That cream is guaranteed to produce 20 pounds of butter to the hundred pounds of cream. Our cream runs all the way from 15 to 24.

Chief Chemist WILEY. How much cream of that would you use to a hundred pounds of these mixed fats?

Answer. That would depend on how high a grade of oil—

Senator HARRIS. For the best grade.

Answer. For the fancy creamery grade you would use so as to get about 20 to 25 pails of butter—you get all the benefit of the gases of the butter just at the breaking point. Then it goes into the fats, and it assimilates more readily, and makes a more perfect union with the butter fats. There is no adulteration in oleomargarine.

Senator HARRIS. Would you not consider the use of lard—that is, so far as confining oleomargarine to the legitimate products of the ox—would you not consider the use of lard as a substitute?

Answer. No; ever since the beginning of the manufacture of oleomargarine it has been known as a compound of beef fat and lard, with sometimes cotton-seed oil, and the compound has always been known—you have known it how long?

Chief Chemist WILEY. Twenty-five years.

The WITNESS. It has always been known as a compound of those fats. It used to be adulterated with butter, but the butter was so poor that they had to take cream to get it. We could buy so little pure

butter to put into it that we had to come back to the cream to get the original. When I want 200 boxes of butter, I have to examine 500 to get 200 on South Water street.

Senator HARRIS. It is always admitted that it is difficult to get good butter.

STATEMENT OF MARC DELAFONTAINE.

MARC DELAFONTAINE, being duly sworn, testified as follows:

Examination by Senator HARRIS:

Q. Please give your name and address.—A. My name is Marc Delafontaine. I live at 121 Honore street, Chicago. I am a chemist and a teacher of chemistry.

Q. Have you devoted any attention to the adulteration of food products, Professor?—A. Yes, sir.

Q. What class of food products?—A. In a general way, almost every kind, because I am an analyst, and I have much to do with analyzing for people various articles of food in great variety. Besides that, I have paid great attention to all those questions for the past thirty years that I have lived in Chicago.

Q. What do you know from your work as to the character of coloring matter used in butter and imitations of butter?—A. Well, until comparatively lately annatto was extensively used, but during the past year or so I had to examine samples of butter and butterine the coloring matter of which was not annatto. It was one of the aniline or coal-tar colors or a derivative from them. Whether it is poisonous or not I am not prepared to say. I know that some of them are very poisonous. It is a matter that should be investigated.

Q. You think the use of the coal-tar coloring matters, the products of coal tar, is taking the place of vegetable coloring matters?—A. It seems to be, yes, sir, so far as my experience goes.

Q. That would be true not only of butterine and butter, but of many other things?—A. Yes; confectionery, etc.

Q. The coloring matter in pickles and jellies and preserves?—A. Some of them.

Q. You think those products are working in the same direction?—A. The red and the yellow.

Q. Have you ever come across copperas as a coloring matter in pickles?—A. No.

Q. Or alum?—A. No, sir.

Q. What has been the extent of your observation with regard to the adulteration of spices?—A. I have not done anything in that line for years, only at the time when I investigated articles of that kind I found that almost all of them were largely adulterated with inferior substances that had no strength. They were simply diluters and added weight. Diluters is the word.

Q. Not necessarily with anything injurious to health?—A. No.

Q. Do you regard the use of alum in pickles and other substances as injurious to health, Professor?—A. In pickles? I have no experience at all in that line. I do not know. I do not see what good it would do to put it there.

Q. As a mordant; I believe it is used to fix the colors.—A. Strong vinegar would be better; but I do not know anything about that. I can not testify as to that.

Senator HARRIS. Have you ever had any connection with baking-powder production?

Answer. Oh, yes; I have done much work in that line.

Senator HARRIS. I mean have you been interested in the production of baking powder?

Answer. No; not in the manufacture; no, sir.

Senator HARRIS. Have you been employed by baking-powder companies?

Answer. Not as a regular chemist. I have analyzed often.

Senator HARRIS. You have been employed to make analyses?

Answer. Oh, yes; as an analyst for quite a number of different companies.

Senator HARRIS. Of course your analysis goes to the extent of determining what is in the powder as sold to the public?

Answer. Yes.

Senator HARRIS. Have you ever analyzed the bread which results from the use of any powder?

Answer. I have experimented in that way; yes, sir; with bread and cakes.

Senator HARRIS. Do you think that in the case of powders in which alum is an ingredient you have found a residuum or a nonneutralized portion in the bread which was injurious to health?

Answer. I never detected any; no; unless you call injurious to health a certain sodium sulphate which is the product of the decomposition of the alum products, or unless you call injurious a certain amount of cream of tartar which is the result of decomposition of the cream of tartar products. But there is so little that it does not amount to anything in regard to health. To make more precise to you my answer, alum is sometimes prescribed as an astringent. The dose is from 10 to 20 grains—the medicinal dose. Now, take a baking powder containing, say, 40 per cent of crystallized alum; and if 1 per cent of that quantity should escape decomposition, it would be a very small fraction—less than 1 grain—in a loaf of bread; nothing at all that could be called injurious. We take in much more than that which is injurious in the course of a day. The smoking of a cigar sometimes is worse than the amount of alum or cream of tartar which may escape decomposition in baking. The great outcry against this or that kind of powder is more for advertising purposes than really in the interest of public health. The way the two classes are manufactured now, I think that as regards healthfulness or lack of it, the honors are even among them. The cream of tartar powders leave quite a residuum of Rochelle salts. That is a laxative. Well, it may not agree with people to take a laxative. The worst that can be said of the alum powder—and that applies also to the other kind—is that a small amount of alum promotes decomposition. Now, alum is an astringent, and many people need an astringent—something which works against catarrh. Catarrh is a very common affection here in this country.

Senator HARRIS. Do you think that all that would be necessary would be to require the formula to be printed on the label, so that people would know just what they were using?

Answer. I do not know about that. It would be all right if people were well educated and understood the chemical changes which take place in the baking powder which is used in the kitchen; but so long as they are not educated up to that they get frightened by that word "alum," because they fancy and they are made to believe that the

alum remains in the powder during the cooking. So that it might be done in some other way.

Senator HARRIS. Don't you think that if there is a fear or superstition or prejudice that it should be respected?

Answer. Oh, no—

Senator HARRIS. I may have an unnatural and unnecessary fear of a certain thing, but that is no reason why that thing should be palmed off upon me without my knowing it, is it?

Answer. Oh, I understand that. I was going to add this: That the label might give the formula, or, in a general way, the components, and then the maker might make his statement that after all, after the thing has been used, there is nothing injurious in the use of it.

Senator HARRIS. Of course, he could make any explanatory statement that he saw fit.

Answer. Yes.

Senator HARRIS. But you certainly would consider it a fair proposition that everything as it is sold, as it passes from the seller's hands—this reaction has not taken place, and therefore the composition of it, exactly as it stands, could be thoroughly required?

Answer. Yes; that really should apply to all kinds of mixtures.

Senator HARRIS. To everything?

Answer. Whether it be mustard, or anything of that kind. The English law, I think, is the best in that respect, requiring the label to state what there is in the bottle or bag or package.

Senator HARRIS. The percentage of everything?

Answer. As near as possible. Then, it is for the manufacturers to educate the people, in the same way, as regards butterine.

Q. You have made analyses of oleomargarine, I suppose, Professor?—A. Yes, sir; many times.

Q. You have found the character of the coloring matter used in that?—A. Yes. I said before that formerly it was annatto and lately—

Q. And the same thing is true of butter?—A. Yes, sir.

Q. Have you ever found any kind of antiseptic preservatives in either?—A. No. Well, I never looked especially for them. In fact, the nature of the fat does not invite the use of an antiseptic. I do not know of any antiseptic which would prevent the fat from turning rancid. They might have put a little salicylic acid in it, but I do not see the good of it, anyway.

Q. Oleomargarine you regard in its chemical constituents substantially similar to butter?—A. Substantially; not identical.

Q. No; but substantially?—A. Yes.

Q. And equally wholesome?—A. Oh, yes; I think so. The manufacturers of oleomargarine are bound to use the very best materials for the manufacture of their article or else it will not sell. They must use the finest grades of fats.

Q. That is, anything inferior would be offensive or repulsive. Is that the idea?—A. I think it would; yes. I think it would be either rancid or bad to the taste, or something like that. Of course, I do not think the best butterine is equal to the best butter, but there are grades of butter which are inferior to a very good butterine—to the average butterine. The manufacturer of butterine has to be most careful about what he uses to make his product.

Q. The butterine also has an advantage in its keeping qualities?—A. Yes; it has.

Senator HARRIS (addressing Chief Chemist Wiley). Professor Wiley, if you would like to ask any questions, you may do so.

Chief Chemist WILEY. Does cream of tartar occur in any natural food; what we commonly know as cream of tartar?

Answer. In grapes. Not in any articles of food that I remember of, except grapes.

Q. Do you regard grapes as a wholesome food?—A. Yes, when taken moderately.

Q. And wine made from grapes?—A. Yes; provided there is not too much sourness or too much cream of tartar in it.

Q. I believe you are a Frenchman?—A. Yes; but I drink any kind of wine, as well as French wine.

Q. Do you know that alum occurs in any natural food?—A. No.

Q. It does not?—A. No.

Q. Then there is a difference between cream of tartar and alum in that respect, in that one does occur in a natural food and the other does not?—A. I am not sure that there is cream of tartar, except in grapes. Yes; there is a little of it which separates from the wine when the juice of the grape is turned into wine. Cream of tartar has some poisonous properties. It is a potassium salt, and potassium salts are poisonous. Tartaric acid, which is a component part of cream of tartar, is a poison, but, as I said, it is a question of dose. It takes a very large dose of cream of tartar or tartaric acid to kill a person.

Q. In that sense any food may be a poison. You can eat enough honey or green apples to kill you.—A. There are some things that you can never take enough of to be killed by them. The capacity of the stomach is too small.

Chief Chemist WILEY. I believe that is all.

The WITNESS. May I add a few words about antiseptics?

Senator HARRIS. Certainly.

The WITNESS. From what I have read in the papers lately it is a matter of suggestion. The outcry against the use of antiseptics is not well founded. We have been using antiseptics for centuries—that is, salt and smoke. Salt is an antiseptic. The creosote in the smoke is also an antiseptic. There are a few others. Vinegar for pickles is also an antiseptic, and there are a few others. Now, as the production of natural articles of food increases and as the consumer lives farther from the maker or the farmer it becomes necessary to use articles that will keep the food products fit to eat and therefore to enlarge the list of antiseptics. But the very best antiseptic affects digestion, from the very nature of its being an antiseptic. It will act either on the food itself or on the ferments in the stomach, the gastric juices or the intestinal juices, or on both. A further question is, Which antiseptic is the least liable to be injurious to the health of the consumer? I do not believe that there is now and there will perhaps never be an antiseptic which will not be more or less injurious to the digestive powers of the consumer. We know hardly anything about formaline or formaldehyde, although some very good experiments have been made lately in Ann Arbor by Professor Novi and Mr. Bliss.

There is another article about which little is known; that is, whether it is hurtful or to what extent it is so or not. It is called preservaline—in other words, sodium fluoride. Salicylic acid in some countries is tabooed. Here it seems to be very largely used without any apparent harm. That may be due to the fact that very little of

it anyway can be used. It is so little soluble. Boracic acid seems to be harmless, but at the same time it is a comparatively poor anti-septic. That, I think, exhausts the list. And the suggestion that I heard offered to this committee is that experiments be carried on by the United States chemists with a view to ascertaining the degree of toxicity or poisonous properties of the new antiseptics and within what limits they may be allowed, or whether they, or any one of them, should be absolutely excluded by laws and statutes.

Senator HARRIS. That has been one of the questions discussed here several times, whether within certain limits certain things could be permitted.

The WITNESS. Yes; which ones and up to what doses. That is a question for further investigation.

Q. Yes.—A. I don't think that we are sufficiently posted about that now, in the present condition of science.

STATEMENT OF PROF. E. N. EATON.

Prof. E. N. EATON, being duly sworn, testified as follows:

Examination by Senator HARRIS:

Q. Please give your name, residence, and profession.—A. E. N. Eaton is my name. I am a chemist by profession, at present with Professor Young at room 1760, Monadnock Building.

Q. Are you connected with any public institution at the present time?—A. I am not now. I have been. For three years I was assistant chemist at the Iowa Agricultural College.

Q. You are engaged here as an analytical chemist?—A. Yes, sir.

Q. Have you made extensive analyses, Professor, of food products?—A. I have. More especially in Minnesota, where I was chemist to the State dairy-food commission for four years.

Q. What is the food product that you think is generally the most adulterated, so far as your observation goes?—A. Well, I believe that vinegar is adulterated more extensively than any other article of food.

Q. That is adulterated, I suppose, in both ways—that is, it is adulterated with a weakening fluid, and it is also adulterated by the use of acids which would be injurious to the health of the public?—A. It is diluted invariably, and that is all right, I believe, when carried to a certain extent, because vinegar as ordinarily made is far too strong for consumption; but to my knowledge there have been no foreign acids added to vinegar in this country. In England they did to a certain extent add sulphuric acid as a preservative, but not in this country. Acetic acid is one word—

Q. That could be covered by a statement to the consumer as to the extent of the dilution?—A. Yes, sir.

Q. You say there are no acids used in this country in the manufacture of vinegar that are injurious?—A. I believe not. There is no acid used except acetic acid.

Q. Sulphuric acid is used?—A. Sulphuric acid is not used. The principal adulterant of vinegar is the substitution of low-wine vinegar and beer vinegars and malt vinegars, colored for cider vinegar.

Q. That is a substitution of one kind for another?—A. Of one kind for another; yes, sir.

Q. Are those classes of vinegar injurious to health?—A. I believe not.

Q. They would differ from the other only in flavor and strength?—
A. That is all.

Q. And not in wholesome qualities?—A. Yes, sir.
Chief Chemist WILEY. What would you define to be vinegar? What would be your definition of vinegar?

Answer. Well, I should want to limit that. Can you name some special kind of vinegar? If you ask me to define any particular kind or brand of vinegar, I could do so.

Q. Would you consider that any one brand of vinegar should be permitted alone to bear the name of vinegar?—A. I would not.

Q. I mean by that that vinegar should mean one particular substance, and that every other substance not that, but resembling vinegar, should bear some specific name?—A. Yes, sir; and I doubt if there is any substance which we call vinegar.

Q. Then, would you say cider vinegar?—A. I would say cider vinegar, old wine vinegar—

Q. Malt vinegar?—A. Yes, sir. The word vinegar in itself means nothing.

Chief Chemist WILEY (addressing Senator Harris). In this country, Senator, the term vinegar is usually used to imply cider vinegar. In England it never is. The term vinegar there means malt vinegar. In point of fact a great part of the vinegar that is made in this country is made by the oxidation of high wines, simply taking the products of the distillery, the low wines or the high wines, as they are called, whichever they may be, and running them over beet shavings, and in that way oxidizing them rapidly and transforming them into acetic acid. Then they are colored and flavored to look as much as possible like cider vinegar.

The WITNESS. I just want to add to the doctor's statement that vinegar so prepared contains a very large percentage of acetic acid, as high as 10 or 12 per cent, and it must then be diluted before it is consumed, because that is entirely too high. About 4 or 5 per cent strength is probably as high a degree of strength as should be had in vinegar, although 5 per cent would not be too high. I have examined vinegars, hundreds of them, as low as 2 and 3 and 4 per cent. The State of Wisconsin requires 4 per cent, as that State requires 4 per cent of acetic acid in vinegar.

Q. Do they fix a maximum?—A. No; Minnesota requires 4.5 per cent.

Senator HARRIS. You think the interests of the country would be subserved by labeling each kind of vinegar as the product of a certain other article, and with a standard established by law of strength, a percentage of strength?

Answer. I do; although I would establish a minimum standard.

Q. I say, with a minimum percentage. That is what I mean.—A. With a label law or a brand law for any percentage of acid higher than that standard.

Q. Do you think that could also be applied successfully and beneficially to various spices that are ground and sophisticated with harmless substances?—A. I do.

Q. Ground spices—I suppose you have examined and find them more or less adulterated?—A. I have examined quite a number of them, but I have not made a special study of spices, such as I have of baking powder and honey and lard and the dairy products.

Q. Do you find lard adulterated largely?—A. It was adulterated very largely two years ago.

Q. It is not so much adulterated now?—A. I could not say, because I have made no analysis of lard for two years.

Q. What do you find it adulterated with?—A. At that time it was adulterated with beef fat and cotton-seed oil.

Q. Inferior beef fats, do you mean?—A. No, sir; I would not say that they were inferior beef fats. They were beef stearin. Probably used as a by-product in the oleomargarine.

Q. A resultant from the production of oleomargarine?—A. Yes, sir; a by-product.

Q. And cotton-seed oil.—A. And cotton-seed oil.

Q. Did you regard that as in any way injurious to health?—A. I did not.

Q. Simply a financial fraud?—A. Yes, sir.

Q. Do you think the use of antiseptic preservatives is general now in supplies liable to decomposition?—A. It is in certain products, very general.

Q. Do you regard it as dangerous in the quantities in which they are used?—A. I should not care to testify on that point, because I have not made a personal examination.

Q. Outside of your own reading?—A. Just my reading, that is all.

Q. Would you regard it generally as unsafe when used in food products, even in small quantities, substances which in moderate doses produce injurious effects upon the system?—A. I would consider it safe to use it in quantities such that it did not have a physiological effect in the amount of the food used.

Q. Would you consider that the continued use should be taken into consideration in estimating its effect?—A. Not if the product is not what is called a cumulative poison. If it was a cumulative poison, such as lead or mercury, that would be a factor, but in the case of, for example, coloring matter or preservatives, I do not think that should be considered.

Q. You think the stomach would not gradually be injured—the digestive powers of the stomach gradually injured—by the use, even if it was not cumulative?—A. I do not think it would. If one single dose would not produce any effect, I think perhaps continued use would not.

Q. Nothing added to nothing would still produce nothing. That is your position?—A. Yes, sir.

Senator HARRIS. I believe that is all that occurs to me. If you have any suggestions that you can make to the committee in this connection, we would be glad to have them.

A PERSON PRESENT. This gentleman has made a sort of specialty of honey analysis, and perhaps he can add to something that has already been stated.

Senator HARRIS. In the analyses of honey which you have made, Professor, do you find anything used as an adulterant, substantially other than glucose, such as has been testified to before?

Answer. I have found cane sugar used as an adulterant in honey in two ways—as added to the strained or extracted honey and as fed to the bees. With that exception, I have found no other adulterant in honey.

Q. Of course you would not regard that as an injurious adulteration?—A. It is not an injurious adulterant. I have suspected the adulteration with invert sugar, as Professor Wiley explained, a sugar which is the sugar of honey as produced by the honey bee, but I have

not been able to substantiate the fact that honey is adulterated with invert sugar.

Q. Then, in the case of honey, simply an honest label is all that is required?—A. I believe so.

Q. Which should state the composition?—A. Yes, sir. I will state one thing in addition to what Dr. Wiley said in regard to feeding bees cane sugar, and that is that this abnormal percentage of cane sugar is very marked in fresh honey, but after the honey is old the sugar seems to be inverted largely into invert sugar, so that it is very difficult, if not impossible, to detect it. There is one thing I might add in regard to baking powders, and that is that I believe it would be of public interest if all baking powders should be labeled with the minimum percentage of gas which the powder is calculated to evolve, in the same manner that the laws on the same subject in the East are carried out, because it is important for the consumer to know it; for, other things being equal, the value of a powder is dependent on the amount of gas evolved; some only evolve 5 or 6 per cent; others will evolve as high as 15 or 14 per cent.

Q. Not only the ingredients but the results?—A. Yes. And I would not put the formula on the label, because I believe the formula of the composition of a valuable article is the property of the inventor; but I would label the various classes of baking powder with the class to which they belong. For instance, there are four different kinds of baking powder, alum, alum phosphates, cream of tartar, and the pure phosphate powder; and those are all different in their action and in the residuum which they leave in the bread; and those different kinds of powders I believe should be labeled, but not the complete formula.

Q. I see; you think that is the private property of the manufacturer?—A. I hardly think it is quite fair to put a label, "This powder contains alum," at least until the fact that alum is positively injurious is established, because it conveys to the purchaser the meaning that it is harmful and very much inferior.

Q. The purchaser would certainly then be in a position to exercise his own judgment as to the matter?—A. He would; but that stamp, with the statement on it, convinces his mind always, whether fairly or not, that the powder is actually injurious or not; and if it is injurious I believe it should be prohibited, and if not it should be given just the same right as any other class of powder.

Q. Cream of tartar baking powder would also have the same stamp?—A. Yes; that would be all right.

Q. That would be just the same?—A. If the cream of tartar powder was compelled have same stamp on every package, and the phosphate powders, it would be all right.

Q. I don't think anyone has suggested the idea that any one thing should be singled out, but that everything of any specific class should carry a label indicating its component parts.—A. But that is the case as we have it now in various States. The State of Minnesota and the State of Wisconsin and several other States require a statement on the label that "This powder contains alum."

Q. Your position would be that before such discrimination as that should be exercised most complete proof should be furnished that it was absolutely injurious?—A. Yes, sir.

Q. While in that case it should be absolutely prohibited?—A. Yes, sir.

Q. So that it would not be necessary to repeal it.

STATEMENT OF ORT COOKE.

ORT COOKE, being duly sworn, testified as follows:

Examination by Senator HARRIS:

Q. Please give your name.—A. Ort Cooke.

Q. What is your occupation?—A. I have done more farming than anything else.

Q. Are you a farmer now?—A. I am not.

Q. What are you engaged in now?—A. I am reducing theory to simple practice, if that is a fair—

Q. Sir?—A. I have been reducing theory to practice in the way of making improvements on mowing machines and on a substitute for maple-sugar sirup.

Q. Are you engaged in the manufacture of such substances?—A. No, sir; I am simply working my ideas down to be put in practice.

Q. You are endeavoring to prepare a substitute for maple sugar?—A. Yes, sir.

Q. Do you care to make public the articles entering into this substitute?—A. Do you mean the formula itself?

Q. No; I don't care for the exact proportions, but you can name the ingredients.—A. I could come pretty near that. I can say that it is vegetable and wholesome. Here are some samples, if you care to look at them.

Q. That does not answer the question. I do not ask you for the character of the components, but for the names of the components.—A. Do you mean the name of the flavor they make use of to get this flavor?

Q. What do you propose to make the substitute of—glucose, probably, I suppose, and some other thing?—A. Two kinds of grocery sugar.

Q. I merely suggest that—.—A. Sugar.

Q. Sugar and what?—A. Flavor.

Q. Well, what kind of flavor? What is it?—A. It would be a maple flavor.

Q. What is it made of?—A. I don't think that I could answer you.

Q. I have no right to insist at all upon anything of that kind.—A. If you will pardon me on that. That is my covenant.

Q. That is what we want to know here. If you can not give us what you propose to make this of, I don't see wherein we are going to be helped any. Of course you think it is not injurious.—A. No. I will leave it to a chemist in regard to that.

Q. Have you ever submitted it to analysis?—A. I have.

Q. Are you willing to supply Professor Wiley with a sufficient quantity to analyze?—A. I truly am; yes, sir.

Q. You have not engaged in the manufacture of this?—A. Not yet.

Q. There is none of it on the market?—A. No. I have simply shown it to some of the leading men and told them the facts of the case, as to what I was trying to substitute. I used to make sugar on the farm and know something about sugar-camp life.

Q. Whether it is good, bad, or indifferent, it has not been accomplished yet?—A. No, sir. I was encouraged to come here through Attorney Esty, in conversation. He says, "I believe I would go before Senator Harris and Senator Mason and show this." I accepted his advice and have come. That is all.

Senator HARRIS. Well, if we do not know what it is composed of, I hardly know what we could do with it except to have it analyzed and ascertain. I believe that is all that is necessary, Mr. Cooke.

STATEMENT OF WILLIAM S. EDWARDS.

WILLIAM S. EDWARDS, being duly sworn, testified as follows:

Examination by Senator HARRIS:

Q. Please give your name, address, and occupation.—A. William S. Edwards, Chicago, Ill.

Q. What is your occupation?—A. My occupation at present is handling a natural mineral water, supplying it to the country—supplying it, particularly, to Chicago and through the country.

Q. Have you any experience in the general business of mineral waters?—A. I have had for the last twenty years, all through this country, all through the United States—that is, east of the Mississippi River.

Q. For the purposes of this committee can you state any facts as to the adulteration of mineral waters?—A. I have had considerable experience in regard to the adulteration of mineral waters, and particularly in regard to carbonated drinks in the form of seltzer. I have had some experience which has shown that a certain bottle attachment, called an attachment, has caused an immense amount of suffering throughout the country in the form of rheumatism and neuralgia.

Q. Owing to what?—A. Owing to the lead poisoning that came from the highly carbonated water being used through those siphons.

Q. Through the siphons?—A. Yes. In one instance, at Hornellsville, N. Y., Dr. Robinson's death was caused by the use of water from these siphons.

Q. That would not be the fault of the water?—A. It was caused by the lead poisoning.

Q. It was simply the method in which it was used?—A. Yes.

Q. What we want to inquire about is the characteristics of the waters themselves.—A. Well, my point, more particularly, was to inform the committee about one thing there, and that is the injurious effects of lead siphons throughout the country, where people suppose those siphons are blocked tin instead of being lead. Principally they are composed of alloys of different kinds of lead and pewter, and different kinds are really injurious to public health.

Q. The water, by passing through this lead, of course becomes poison.—A. Highly carbonated water in passing through the lead acquires poisonous properties. At the World's Fair I discovered twenty different alloys of blocked tin which were used there, and it occurred to me that the Government really should investigate that fact and ascertain how many different alloys there were that were used in these different siphons.

Senator HARRIS. I do not think that is within our province. Of course there are a great many ways in which food products can be prepared and used and served which may make them injurious. The limit of our instructions goes simply to the character of the food products and drinks; so that I would not care to take up that question. In these sirups and mineral waters are there any injurious properties that you know of?—A. I have, in my observation, obtained information of a great many different poisons which are used in colors.

Q. In the sirups?—A. In the sirups; and I have been in nearly all the bottling establishments east of the Mississippi River, and have had occasion to do business with them. I have found that they use a great many of what are said to be poisonous substances in coloring.

Q. Would you suppose them to be these aniline dyes, or what do you think is the poisonous substance?—A. I have not investigated sufficiently to give the committee an intelligent idea. I have merely obtained information from different parties who have used them and observed their bad effects.

Senator HARRIS. I do not think there is anything else that we care to consider.

An adjournment was here taken sine die.

JUNE 5, 1899.

The committee met at 10.30 a. m., at room 201, Grand Pacific Hotel, Chicago.

Present, the chairman.

STATEMENT OF ROBERT T. LUNHAM.

ROBERT T. LUNHAM, being first duly sworn, testified as follows:

Examination by the CHAIRMAN:

Q. What is your name?—A. Robert T. Lunham.

The CHAIRMAN. What is your business?

Answer. Packing business—pork packing.

The CHAIRMAN. What is your firm name?

Answer. Boyd, Lunham & Co.

The CHAIRMAN. Do you pack for export?

Answer. Yes, sir.

The CHAIRMAN. As well as for home consumption?

Answer. Yes, sir.

The CHAIRMAN. Mr. Lunham, before this committee we have taken the evidence of a good many witnesses, some of whom are scientists of national reputation, on the subject of antiseptics and preservatives which are used in articles of food, and I desire to know from you, so far as I can properly, and without inquiring into any trade or business secrets of yours, your ideas as to the use of antiseptics—what you consider proper to use—if you don't object to stating just what you do use. You understand we have no disposition to pry into people's business, but the proposition before the committee is to submit some national legislation. Several scientific men have recommended us to recommend a bill which almost prohibits the use of antiseptics in various articles of food. If you have no objection, I would be glad if you would state the antiseptics that you have to use in your business, or what is common in use in the trade, leaving out the question of your firm.

Answer. I hope you don't ask me to give my scientific views on the matter, because I am not much on that. I am more on the practical side.

The CHAIRMAN. I understand that. I expect to call some people more on the scientific branch of it. I want to know what the habit and custom is as to the use, for instance, in exporting—packing meats that you export. Do you use any antiseptics or preservatives in exporting meat?

Answer. We use borax only in our export meats, but I would hardly call that a preservative, the way we use it. I would call it more—well, we use it more to protect the meat than to preserve it. The meat

is already preserved when we apply the borax to it. We have been exporting, Mr. Chairman, for twenty-five or twenty-six years. We started in knowing nothing of borax in our trade, and as the business worked along we found that the English people especially found fault with our goods because they were too salty. We had to set our wits to work and find something that would obviate that, something that would put the stuff before them as they required it, and after a good deal of experimenting and investigating we found out that borax was just the article required. There is no secret about it, and never was. We told them what we were doing, and of course had them report on it as we shipped the stuff along.

At that time we were doing a very small business. In fact, the Englishmen would not buy the stuff we shipped in those days, because they had to see it. They were a little suspicious of us, because they thought we were very crude and didn't know how to put the stuff up. The American packers had a great deal to learn. They used to get their stuff too salty and keep it too long—anyway it didn't suit their epicurean tastes over there. But this borax has served to solve the whole problem. They said: "That is what we want. Why didn't you give it to us before?" That business has grown—

The CHAIRMAN. That is what I want to know.

The WITNESS (continuing). Tremendously. The city of Liverpool alone will take from 18,000 to 20,000 boxes of our bacon weekly. Twenty-five years ago they wouldn't take that much in a year; and when we pack this stuff for them, we simply take the meat right out of the salt where it is cured, or saltpeter, and we apply just as little borax as we can to the surface, because it is expensive stuff, and the least quantity we can get along with to fill the purpose the better. When that meat gets over there this borax is all washed off. It simply keeps the meat from getting slimy on the way over. It gets exposed to heat in transit, and the borax keeps it from getting slimy. As soon as they get it over there they take it out of the box and wash the borax off, and it is put in the same condition it was in when it left here. Although I have never seen the meat unpacked over there myself, yet those of our firm who have gone over there and seen it unpacked have said that there is about as much borax washed off the meat when it gets there as there was put on it here originally. I should say we use about from 1 to $1\frac{1}{2}$ per cent on the surface of the meat when it leaves here.

The CHAIRMAN. From 1 to $1\frac{1}{2}$ per cent?

Answer. Yes. We use as high as 7 pounds a box—500 pounds to the box—500 to 600 pounds. If the meat is dry, we use less, because less adheres to it, although we brush it off as much as we can when we are packing it, to economize the borax.

The CHAIRMAN. As a matter of fact, do they insist on having it cured in that way? Do they make orders saying that it shall be cured with borax?

Answer. Most decidedly; yes, sir. All our code books read that way. We can't sell goods to them packed in salt. They won't have it.

The CHAIRMAN. You say you have been using borax for a good many years?

Answer. We started to use it in 1875, and our trade has been increasing ever since.

The CHAIRMAN. Have you ever heard, or has there ever been any complaint made to you through any department, of any deleterious effect on the health of anyone from the use of pork cured by borax?

Answer. No, sir; I never heard of anything of that kind until the last few weeks, since this agitation has been started. I have used a good deal of it myself. When I take meat home I always have it rubbed in borax. It keeps the flies off of it in summer time.

The CHAIRMAN. What is boracic acid; do you know? It is really ground borax, isn't it?

Answer. The same thing; yes.

The CHAIRMAN. It is the same thing?

Answer. Yes. As I understand it, boracic acid is in the crude state, but we use it pulverized. It just looks like flour.

Q. What percentage of the exports of pork go out boraxed?—A. Well, I should say, to what we call the fancy English trade, 95 per cent of the meat is packed in borax. You see the reason they want it in borax is this: That if we put salt enough on it to keep it in condition until they get it before the customer or consumer, they get it so salty that they can't use it; so when we pack it in borax we keep it in salt until it is safe. Then we pack it and put it in a box, with the borax sprinkled over it, and that keeps it in condition until they get hold of it. It doesn't cure any more. I have always been under the impression that the meat didn't absorb any of the borax whatever. I read so many things in the paper nowadays about it that I begin to think the newspapers know more about it than I do.

The CHAIRMAN. You haven't any expert knowledge on the question as to the absorbing qualities of meat after it had been cured in salt? I suppose you don't care to give any opinions as an expert. You have your own theory, though, that it does not absorb the borax.

Answer. I believe it does not.

The CHAIRMAN. You believe it does not?

Answer. Yes, sir.

The CHAIRMAN. And when they eat meat, as a rule, the one who eats it does not get the borax?

Answer. There may be a certain amount on the surface that remains, but the percentage must be very small. Of course, we have never given that much study, because we look on it as perfectly harmless. I have seen customers of ours whom we have had for twenty-five years, and they look very healthy, and they eat that boraxed meat all the time. They laugh at me when I ask them if it disagrees with them. It is an absolute necessity to us in our business, because we have so much confidence in it.

The CHAIRMAN. You have never heard of any exception to that rule?

Answer. Never.

The CHAIRMAN. That is, you have never heard of persons being made sick from the use of borax?

Answer. No, sir.

The CHAIRMAN. Could you carry on your business without the use of borax, so far as any known preservative is used now?

Answer. Well, no. If we couldn't use borax it would bring us to a standstill. Something would have to be found to take its place.

The CHAIRMAN. Do you think of anything else you wish to state in regard to that matter, at all, Mr. Lunham?

Answer. No, sir; I believe not.

The CHAIRMAN. You say you have used borax for twenty-five years. Within what time has it begun to increase in use—that is, this large increase that you speak of in the trade generally?

Answer. For the first year or so I think we were about the only users of it, and by degrees the other packers found themselves compelled to use it. In fact, they used to look on the use of borax as a sort of curiosity, I remember, at one time, and we had to furnish the borax when we bought the stuff outside from these other packers; but it was a very short time, a very few years, before they all got into the use of it, and now it is in general use and has been for fully twenty years.

The CHAIRMAN. Do I understand you that you get your orders by mail and by cable, and that these orders direct the use of borax?

Answer. Yes, sir; in our code books everything reads—at the head of every page is: "To be packed in borax." That is to our English—what we call our English fancy trade.

The CHAIRMAN. Is that so in Germany as well? You get some orders from Germany, I suppose?

Answer. Yes, sir.

The CHAIRMAN. Do they want it the same way?

Answer. Yes, sir; they do. There are some classes of meat that you can't ship in salt. The meat would arrive in such shape that it could not be used, more especially pickled-cured meats and shoulders and all that kind of stuff.

The CHAIRMAN. What do you say as to the comparative strength of the ham when packed in salt and when packed in borax? Which makes the stronger ham?

Answer. The stronger cure?

The CHAIRMAN. Yes.

Answer. Of course the borax has nothing to do with the cure. You have got to cure your ham before you apply the borax.

The CHAIRMAN. I understand. After you have it cured with salt you put on the borax. What effect does that have? What effect does the borax have as to the strength of the ham?

Answer. It has no effect.

The CHAIRMAN. It preserves it right where the curing process left it?

Answer. Yes, sir.

The CHAIRMAN. Without hardening it?

Answer. When you take the meat out of the salt and expose it to the weather it will form a slime which will ruin it in a very short time. Borax stops that slime and affects only the surface. It will not affect the inside. It is only the surface.

The CHAIRMAN. I think you have already stated that if you pack it in salt and ship it over there it would be too strong—the salty taste—for their taste?

Answer. Too salty; yes, sir.

The CHAIRMAN. And it would not be so merchantable or salable if it was too salty?

Answer. It would be worthless. We can't sell hard, salty stuff over there.

STATEMENT OF C. Y. KNIGHT.

C. Y. KNIGHT, being first duly sworn, testified as follows:

Examination by the CHAIRMAN:

Q. Mr. Knight, you have assisted the committee before with your evidence. You are connected with a dairy journal. What is the name of it?—A. The Chicago Dairy Produce Paper.

The CHAIRMAN. And you have given this matter of dairy products your careful study for some years?

Answer. Yes, sir.

The CHAIRMAN. I wanted to know, for the benefit of the committee, your judgment, from a practical standpoint and from a scientific standpoint, as I think your evidence shows that you have put yourself within that class, what you have to say about the use of borax in butter.

Answer. A year ago last winter I went to England for the purpose of finding out why we could not lay our butter down in the English markets in the condition that it came from Australia or Argentina, Australia being probably three times the distance and coming across the equator, and Argentina being a greater distance from the English markets than our American ports and shipping points. I made a very careful investigation in Liverpool, Manchester, London, and Bristol on those points. The universal verdict of the butter men was that our butter would not stand it. That is to say, it hadn't the keeping or staying qualities that were possessed by the Australian and Argentinian and French butters, one great difficulty being in the methods the English people pursued in taking care of their butter as compared with ours. They use no ice boxes over there.

Then I went to the largest importing firm of Australian and French butters in London, which is largely the distributing point for all of England with those butters, and questioned them regarding the method in which the butters were packed. Such firms as Trengrouse Brothers, Lovell & Christmas, Mills & Sparrow, and others of the largest importers, told me that they would not think of importing butter from Australia and Argentina, or wouldn't think of putting the French butters in the shape that they are placed on the English market without the use of a preservative. I then questioned them as to the character of the preservative and they told me that it was a boron preservative that was put up by companies who use borax as its basis; that it was practically all borax; I believe a little salt added to it; but it was a purified precipitate and was refined borax, different from the borax that comes out of the ground to the extent of having been purified.

I also carefully investigated the matter by interviewing Australians. I don't know but I have in my pocket the name of a man—

The CHAIRMAN. Before you leave that English matter, may I interrupt you a moment?

Answer. Yes, sir.

The CHAIRMAN. Did they give you any idea as to how it was used, whether it was mixed in the mixing of the butter or put around it after it was made. Did you investigate the manner of preserving it there?

Answer. I didn't there, Senator, but the method is very simple, and done the same the world over. It is either mixed with the salt or sprinkled on the butter before the working and worked in. It is put through the butter. There is no question about that. I had an Australian visit me a few days ago—I will give you his name—Mr. James Patton, of W. H. Bartram & Son, of Melbourne, who brought a letter of introduction to me from New York, and I questioned him very closely, his firm having charge of the exportation of 75 per cent of the Australian butter that comes to London or to England. I questioned him very closely in regard to this matter, because I have been placed in considerably the same position from publishing the truth as I find

that the English people have in their criticisms of the public, and he told me that they had practically come to the conclusion that the export butter trade from Australia would be a total failure without the use of that preservative.

(The witness was withdrawn from the stand temporarily.)

STATEMENT OF FRANK BILLINGS.

FRANK BILLINGS, being duly sworn, testified as follows:

Examination by the CHAIRMAN:

The CHAIRMAN. What is your name?

Answer. Frank Billings.

The CHAIRMAN. And your profession and residence?

Answer. Physician; Chicago.

The CHAIRMAN. Doctor, we have been having before this committee some evidence upon the use of antiseptics in food products, or preservatives—perhaps that is a better word. We have had some scientific opinions as to the use of borax, and the committee would be very glad to have your opinion as to the use of borax in the preparation of food products? What is borax, to start with, Doctor?

The WITNESS. I beg your pardon?

The CHAIRMAN. What is borax?

Answer. Borax is a salt, coming from the element boron. It occurs in nature as borax. Borate of soda is its chemical name.

The CHAIRMAN. It is mined in its natural condition?

Answer. Often mined in its natural condition.

The CHAIRMAN. There has been considerable discussion before the committee, some experts feeling it was dangerous to be used in preserving meats and butter and other articles of food; and the witness who has just left the stand, Mr. Lunham, testifies that his meat is preserved that way, practically, and that he ships abroad, and that it is so ordered from Germany and England. We would like your opinion about it, if you will be kind enough to give it.

The WITNESS. Perhaps I might say a word or two in explanation of what I would have to say in that respect—

The CHAIRMAN. State it in your own way.

The WITNESS (continuing). So that it would be better understood. Borax is a salt, a substance which we use very commonly in medicine, and which is even used in domestic affairs very much as the so-called bicarbonate of soda is used. A common cooking ingredient and a common medicinal remedy. Borax has come into more common use in recent years and has supplanted bicarbonate of soda, both in domestic and in medicinal use, both because it is in one sense slightly antiseptic, stopping fermentation and decomposition better than soda, and at the same time is as good a neutralizer of acids as bicarbonate of soda. As far as its medicinal effect is concerned, we use it in medicine, outside of surgery, very much for the purpose of neutralizing acids and cleansing surfaces. I use it every day, for instance, in stomach disturbances, washing out stomachs, putting from 1 to 5 per cent of it in water to render the water slightly alkaline and to better remove mucus from the surface of the stomach, and also to neutralize the acid, any abnormal acid, which may be there; and I use it with impunity.

However, like every other ingredient, borax or boric acid, which

is the essential acid from which it is made, would be poisonous if over-used medicinally. Large doses of it might produce untoward effects, and especially might it produce untoward effects in certain individuals, because some individuals have idiosyncrasies to the use of anything, even to simple food products. One individual can not take honey, for instance, because it poisons him; another individual can not eat fresh fish. One individual can not take soda because it poisons him. One individual might not be able to take borax or boracic acid because it poisons him. But, beyond those things, and if used as we use everything else, in proper dosage, it is not poisonous. In surgery it is used as an antiseptic, both in washing wounds and in packing wounds. Immense amounts of it are dusted on the surface of wounds for the purpose of keeping them clean and to prevent the growth of pathogenic germs upon wounds. And while there is a history in medicine of an occasional untoward effect from it, there is no bad, common general effect. I mean there is no common effect from it. It will occur in individuals as poisoning would occur from the eating of honey, for instance, or because probably of the peculiar idiosyncrasy of that individual.

Now, it bears the same practical relation to other so-called preservatives in preserving meats that it does in medicine. It has come in recent years into more common use in preserving meats, especially hog products, and in preserving butter, because it was found that those things kept better with it than they did with common salt. And to my mind it is no more injurious in overdosage to the human economy than would be common salt when used in the same way. It is a well-known fact that fish and meats preserved with common salt, if used too frequently and without other foods, produce scurvy. We know from the history of our shipping interests that sailors suffer from scurvy when they are put upon salt meats without fresh vegetables, and that is due entirely to the too continuous use of common salt. The same thing would hold good with boric acid if used. If the meats preserved with it were used in the same way, an untoward effect might be produced; but there is no more danger, to my mind, in preserving with borax than there would be in using a meat preserved in the same way with common salt. I do not know that I can add to that short statement.

The CHAIRMAN. The effect of common salt upon the stomach, Doctor, is not to stop fermentation, is it?

Answer. No, sir.

The CHAIRMAN. But the tendency of—

Answer. I beg your pardon. It does in one way. Common salt is decomposed in the stomach and forms hydrochloric acid in the stomach, the natural acid of the stomach, and when taken in certain amounts is salutary and healthful. Hydrochloric acid in the stomach is an antiseptic, and is the thing above everything else which preserves the human body against germs which enter the body in that way. Cholera and typhoid-fever germs probably can not gain access to the body by the stomach which contains a natural amount of hydrochloric acid, or at least it very materially wards off those diseases; but beyond that it is not an antiseptic in the sense of applying it to a wound or anything of that kind. And if taken in large amounts, instead of producing that salutary effect, while hydrochloric acid may be there, it will directly sicken the individual and produce blood states which are similar to scurvy; that is, common salt will.

The CHAIRMAN. You think you could use with safety the same amount of borax that you can of salt?

Answer. I do, in the preserving of meats.

Q. You have used borax medicinally, you say?—A. I use it every day.

The CHAIRMAN. And not only for the cleansing of wounds externally, but for internal use—for the stomach?

Answer. Yes.

The CHAIRMAN. And its general effect you have already explained, that it has an antiseptic effect and helps to retard fermentation. Now, how large doses have you given? My idea in asking this would be to see—the evidence before the committee is that in a package of some 500 pounds of meat they would put 6 or 7 pounds of boracic acid or borax. That would be less than $1\frac{1}{2}$ per cent. So that if a person were to eat half a pound he would get a very small amount—or if he were to eat a quarter of a pound he would get a very small amount of borax. What do you say of its constant use? Is there any more danger in that than in common salt?

Answer. Probably no more than in salt. The dosage of borax is about like that of soda, 10 grains or 20 grains or even 30 grains at a dose. But of course one does not give that amount daily. That would be excessive. One would not think of giving soda or common salt daily in that dosage to an individual. It would sicken him. The stomach would not tolerate it after a time.

The CHAIRMAN. And then there is the exceptional case which you have mentioned. To some stomachs it would be more grateful to use salt and to some more grateful to use borax?

Answer. This fact has been proved, that common salt and borax, or boracic acid, up to a certain percentage, increases the power of digestion, including the mouth—that is, salivary digestion—the stomach digestion, and the intestinal digestion. If you go over 2 per cent it retards it apparently in all of them. If you stay under 2 per cent it apparently hastens instead of retards digestion.

The CHAIRMAN. Then, of course, if you are eating meat, from 1 to $1\frac{1}{2}$ per cent on the meat, even if it all remained on the meat, it would not be any special harm?

Answer. It probably could not do any special harm; but it would be impossible to have that amount of borax in any ingredient which you would eat when it was simply put on it to preserve it. It can not possibly penetrate it. Even with butter it could not penetrate it.

The CHAIRMAN. The gentleman who was last on the stand, Mr. Lunham, testified that he was a practical man and a packer, but he had an idea, and his opinion was that the borax did not penetrate the meat.

Answer. No.

The CHAIRMAN. And when they washed it, after shipping it, they practically washed it off? Is that your opinion, from a scientific standpoint, that very little of it penetrates?

Answer. It penetrates the surface of the meat to a slight amount. You do not need a doctor to tell you that. A farmer can tell you that in preserving his hams with salt he must soak them for months with salt brine. You would have to do the same with borax. Salt junk has got to be soaked for months in salt brine before it will penetrate entirely through the meat.

The CHAIRMAN. You know about the use of saltpeter?

Answer. Yes; it is far more deleterious than any one of the other things we have mentioned.

The CHAIRMAN. Will you tell the committee why?

Answer. Because it is a nitrate of potash. Potash salts have a more deleterious effect upon the human body than do the soda preparations, all of them having a tendency to produce degeneration of muscle, for instance of the heart, and a considerably injurious effect upon the kidneys, when constantly used, and all of the nitrates practically have a more specific effect in that way than do the carbon compounds.

The CHAIRMAN. You may state, for my use, your special line of practice and what your experience has been, your course of training, etc.

Answer. My practice is confined to what we call internal medicine—that is, the treatment of so-called internal diseases; diseases of all of the organs of the body, so called; nowadays it is called internal medicine. I have been engaged for seventeen years in teaching or attempting to teach that same subject in the schools.

The CHAIRMAN. What medical colleges are you connected with?

Answer. I have been connected with Chicago Medical, but am now, for a year, connected with Rush.

The CHAIRMAN. What chair do you hold there?

Answer. I have the chair of the practice of medicine.

The CHAIRMAN. You have made, then, a special study in connection with internal treatment of the effect of different food products?

Answer. I have made, probably, an unusual study in the direction of stomach diseases.

The CHAIRMAN. And you are now engaged in very active practice?

Answer. Yes, sir.

The CHAIRMAN. If you have any suggestion to make for the benefit of this committee, we would like to have it. We want a national food legislation, so as to secure uniformity, to let the consumer know, as a rule, what he is buying. If you have any practical suggestions to make, we will be glad to have them.

The WITNESS. The only suggestion I have to make is this, that I believe it is the duty of Government officials, both national and State, to place upon packages a notice which will indicate how the contents of any package is preserved; but at the same time I think or believe that they should also convey to the public the fact that an ingredient used as a preservative is practically harmless.

The CHAIRMAN. Don't you believe that the best way to get at that would be to have a national board—

Answer. Yes, sir; I do.

The CHAIRMAN (continuing). Under some department, so that scientific men could take each question as it arises, just as the other boards of the Government do—like the State board of health, the National Board of Railroad Commissioners, and so on—don't you think it is a sufficiently important subject that the Government should follow every other civilized government in the world, and give some protection to the consumer when he buys to eat and drink?

Answer. I do.

The CHAIRMAN. Have you ever had occasion to examine the question of antisepsics in beer?

Answer. No; I never have.

The CHAIRMAN. You never have analyzed any beer?

Answer. No, sir.

The CHAIRMAN. Formaldehyde is being used a great deal in beers and wines; that is a product of wood alcohol, isn't it?

Answer. Yes, sir.

The CHAIRMAN. You would regard that as a bad thing for the stomach?

Answer. That, I think, is a bad thing to use in foods.

The CHAIRMAN. And salicylic acid, what is that made of, Doctor?

Answer. Salicylic acid is a natural product of some plants, more especially the wintergreen. It is found in about from 70 to 80 per cent in wintergreen oil, in natural product, but the salicylic acid of commerce, of the market, is made synthetically, and is made from petroleum. It is one of the products of petroleum.

The CHAIRMAN. In other words, commercial salicylic acid is not salicylic acid at all?

Answer. Yes; it is salicylic acid chemically, but that which is used is not the natural salicylic acid.

The CHAIRMAN. What do you say as to the use of that in the stomach?

Answer. Well, it is more directly harmful, as it is not a natural ingredient of the body at all and does irritate the stomach very frequently. We use it very frequently and commonly in rheumatism, for instance, and rheumatic disorders, but it is a common fact that it disturbs the stomach very easily, and so we get up different combinations of it, salicylate of soda and salicylate of phenol, known as salol in medicine, which are used, but they are drugs which are not used commonly, as is soda, the bicarbonate of soda, or common salt, or boric acid, or borax. It is used as a preservative on meats and things of that kind, but is used in very much smaller quantities than anything else and can not be mixed with borax or boric acid.

The CHAIRMAN. Salicylic acid and boracic acid will not mix?

Answer. They will mix, but you get so bitter a compound that no one would eat the meat on which they were put. It makes a fearfully bitter compound.

I want to modify this point about salicylic acid this much. It is a splendid antifermentive, and does not necessarily need to be used in large amounts. For instance, a quarter, or even, I suppose, one-tenth of 1 per cent would stop the fermentation of cider, for instance, and in that amount would do absolutely no harm.

The CHAIRMAN. One of the doctors also said that the danger from salicylic acid came because the brewers would frequently use an extra amount of salicylic acid to cover up neglect in proper brewing and to preserve the beer longer by having more in it. But you would think this, Doctor, would you not, that any beer, wine, or cider, or any article of food or drink that contained salicylic acid should show it?

Answer. Yes, sir; I think so.

The CHAIRMAN. Because there are some stomachs more easily affected by it than others?

Answer. Yes, sir.

The CHAIRMAN. We were discussing the question whether we could really get along without food preservatives; and if so, to what extent; whether refrigeration answers the whole demand.

Answer. I have no doubt that refrigeration is the best process we have of preserving foods, but it is impossible to carry it out with our present facilities, practically, and there is no question whatever that we must use some preservative.

The CHAIRMAN. There are some dangers also arising from refrigeration, are there not?

Answer. There certainly is a danger.

The CHAIRMAN. What dangers are there?

Answer. The chief danger is this, that the moment an animal is killed post-mortem changes begin, the formation of toxins, which it would be a pretty hard matter for a layman to understand; the formation of substances the result of, not decomposition, necessarily, and yet it is a beginning of decomposition; and refrigeration may retard that and hold it in abeyance—may so retard it and hold it in abeyance that not enough of it is formed to really be poisonous; and yet there is more or less of that poison in the meat, and this is stopped by a preservative, absolutely stopped.

The CHAIRMAN. Then there is as much, or really greater, danger in refrigeration as there is in a borax preservative?

Answer. Yes, sir; I think quite as much.

The CHAIRMAN. May I ask you a moment longer on the question of aniline dyes. Aniline dyes are, I understand, a product of coal tar, and we expect to call some people who are manufacturers of confectionery. It has been claimed by some that aniline dyes are not deleterious to health, and some say different. Will you be good enough to give the committee the benefit of your opinion and information?

Answer. Very few of them are used medicinally. Some of them are used with impunity. Blue—called methylene blue—usually is a thing which can be taken by the individual with impunity, apparently. It may be taken in such quantities that the urine becomes as blue as indigo without a single untoward effect. Others of the aniline dyes—and there are all colors, compound colors, and soon—are said to produce somewhat poisonous effect from the essential aniline. Aniline is an oily fluid, and from this the colors are made; and aniline oil is said to be somewhat toxic, and some of the colors made from it are said to be slightly toxic, but others are not. Vermilion red is said to be slightly toxic. I suppose that is used a good deal in coloring. Blue is not poisonous.

The CHAIRMAN. Would you recommend the use of aniline dyes generally in confectionery and things going into the stomachs of children?

Answer. No, I would not.

The CHAIRMAN. Or into the stomach of anyone?

Answer. No, I would not. I would like to see the whole thing prohibited in manufacturing candies.

The CHAIRMAN. What do you say about terra alba being used in confectionery, if it is used? If it is disclosed that the candies of the country are largely adulterated with white earth, would you say that was good or bad?

Answer. Bad. Not as a necessarily toxic thing, but as a substance which would be foreign to the body; and while we don't know very much about the effects of earth upon the human economy, we do know that there are a class of people, even in this country, down in the Carolinas, who are earth eaters and who are degenerates. You possibly have heard of them—clay eaters.

The CHAIRMAN. I read an article in a magazine once that I never could believe—

The WITNESS. It is a fact. Those people are stunted and are degenerates who have the habit of eating clay.

The CHAIRMAN. You mean mentally and physically degenerates?

Answer. Yes, sir; mentally and physically degenerate.

The CHAIRMAN. Have you anything further to suggest, that you know of, that is in common use? I don't care to take your time too long, though we are very glad to have it even for a few moments.

The WITNESS. I think not.

The CHAIRMAN. I think you have stated that you used borax or boracic acid very freely in your practice and that you use it with children?

Answer. Yes, sir.

Q. Have you used it for bladder difficulties?—A. Yes, sir.

The CHAIRMAN. Give a period of time and state the quantity that you have used in a case, say, for a week or ten days.

Answer. In washing out the bladder or the bowels or the stomach we use it daily in from 1 to 5 per cent solution. For internal use, a child's dosage of course depends upon its age. For a grown individual 10-grain doses or 20 or 30 grain doses three times a day for a week would be safe, with a proportionate amount for children.

The CHAIRMAN. To retain in the stomach?

Answer. To retain in the stomach.

The CHAIRMAN. That is more than you would get in butter and meat for a year's steady diet, isn't it, practically?

Answer. I think so; and one would use it, let me say, exactly as one would use bicarbonate of soda—exactly in the same way. One would be very unwise to go on and use those things steadily for an indefinite time, but for a week, or one or two days, or perhaps two weeks, no one could criticise the use of borax or of bicarbonate of soda by anyone in that way.

STATEMENT OF C. Y. KNIGHT—Recalled.

C. Y. KNIGHT resumed the witness stand and further testified as follows:

Examination by the CHAIRMAN:

The CHAIRMAN. We were discussing and you were stating the conversation you had with the largest exporter from Australia to England of Australian butter, and he told you—

Answer. Australasian butter. That takes in New Zealand as well. That is what they call the two countries.

The CHAIRMAN. Did you learn by your investigations whether it is put in in the salt or is it dissolved or washed? When we make butter, we put salt in it. Do they put that in the same as they put salt in?

Answer. As a rule it is mixed with the salt, sprinkled with the salt, and then worked.

The CHAIRMAN. They sprinkle the salt with borax?

Answer. With borax. This gentleman told me that their rule was to use 1 per cent with the salt, or on the butter, and the working of the butter, which works out probably 30 per cent of water, or 20 per cent of water, takes up about half of it, leaving about one-half of 1 per cent. That is about the amount that is used in butter, from one-half to three-quarters of 1 per cent when 1 per cent is added. So that really one-half of 1 per cent is the average that is advised by the English importers. But in order to get that you must put in about 1 per cent.

The CHAIRMAN. Have you ever seen any of the orders that they make for butter?

Answer. Oh, yes.

The CHAIRMAN. Do they specify what amount, if any, of borax is to be used?

Answer. I remember one lot of butter that was put up in Kansas two years ago for export for Trengrouse Brothers. That order was for 4,000 boxes, and the order stipulated that there should be 1 per cent added—that is, used—and in the washing-out process that leaves one-half of 1 per cent. That is the only one that I have seen where it was stipulated as to the quantity. The rule is that they take it for granted that an exporter knows how to put up butter with the preservative in, and they simply stipulate, as a rule, what kind of a preservative is to be used. They don't say "preservative," but they generally designate the brand, because there are preservatives and preservatives. Some have salicylic acid and other substances which are regarded as deleterious, which are discountenanced in England—not permitted.

The CHAIRMAN. What do the English purchasers specify in their orders?

Answer. They specify a boron preservative.

The CHAIRMAN. And a boron preservative means borax?

Answer. Yes, sir.

The CHAIRMAN. Do the other shippers of butter into England use more borax than we do?

Answer. You mean to say the larger percentage or the larger—

The CHAIRMAN. No; the larger percentage. That's what I mean. That is assuming that we were not ordered to put it in.

Answer. Oh, yes, indeed. Practically France, Argentina, and Australia all use it, while our attempts have been very largely from people who were not accustomed to or acquainted with the business to try to get along without it.

The CHAIRMAN. Well, relatively, who gets the most of that business in England?

Answer. We don't get very much of it, I can tell you that. We don't get any of it, practically, if they can get it any place else, because you fully realize the sentiment that has grown up here against the use of preservatives. I have run up against it probably more than anybody else in that respect, because, in the first place, people have gotten their idea or sentiment regarding the use of preservatives from the use of a preservative in milk, which everybody knows should be absolutely pure as can be. Milk that is fed by the quart to a child or infant should be absolutely pure, and I don't think that a person should be permitted to put in any kind of foreign substance in that milk, not even water; that there should be no risk there, because a child that lives on milk takes enormous quantities.

You take, for instance, if a child should use a pint or quart of milk a day, it would be taking into its stomach, if there was one-half or three-quarters of one per cent preservative, more of that preservative in one day than a man would take in butter in six months, almost. So that there has been a sentiment, and I think a just sentiment, against the use of it in milk. I certainly should disown it, and I wouldn't advocate it nor permit it to be advocated to our people if I could help it. I am just as much against it as I would be against any kind of a foreign substance in milk if it was deadly poison. That is the way that the sentiment has grown up against the use of preservatives, so that that extends, and has extended without reason, to all other products where the quantity is so small as to be infinitesimal. So that we have people in this country who would not permit people to use a preservative in the factory in any shape. It is a prejudice.

The CHAIRMAN. My attention is called to the fact that the American exporters sent to the Agricultural Department samples of butter to show what the American purchaser would have to compete with. I would like to have the benefit of that in the record, briefly stated.

Answer. The Agricultural Department of the United States has for a number of years imported butters from foreign countries to bring over and show our butter makers what the English markets wanted, and then has advised them not to make butter like it. That is practically the condition that exists. The last convention was held at Sioux Falls, S. Dak., in which there were large exhibits. We analyzed one shown to be preserved with boracic acid. Those were shown to our butter makers to show them what kind of butter the people in England wanted, in order that it might keep and get there in good condition; and yet anyone getting up in that convention and advocating the making of butter in that manner, I think, would have been thrown out of the door, so strong was the sentiment against it.

The CHAIRMAN. How did those butters compare with ours that were not preserved with borax?

Answer. Well, in going the same distance our butters would not have compared in any way favorably at all. They would not have been merchantable at all, going the same distance, I think. Take the butter the way we make it and send it the same distance, and it would have been something like Mr. Broadwell described it, as butter that went into process—process butter. That question of foreign butter is rather a delicate one with the Agricultural Department, because Mr. Wilson is so opposed to the use of preservative that he would not like to acknowledge, or have it known even, that that butter was preserved with borax.

The CHAIRMAN. Then, briefly stated, your opinion, Mr. Knight, is, from your long experience and study, that borax is not an unhealthy preservation for butter and that it would be well to use it where we are trying to compete with foreign markets?

Answer. My observation and the results of my investigations lead me to believe this: That the physicians who have actually experimented and have sought practical examples and made practical experiments extending over a period of years universally testify to the effect that they have had no deleterious effects from it, while other physicians, who go on the ground that anything that will stop any kind of fermentation will also stop digestion, will testify on that ground that any kind of a preservative is harmful, and for that reason advocate the exclusion of it. When I was in England I looked up all the authorities on boron salts. At one time we offered a reward of \$250 or \$300, or something like that, for any case that could be shown where there ever had been, or where it could be proved that there ever had been, any injurious effects from the use of a boron preservative, and the people who had been talking about the injurious effect of these boron preservatives up to that time didn't produce it at all, although we offered to pay the expenses of anybody who would produce it—not only to pay the reward, but to pay the expenses of the investigation, if they would only show where the injury could be found—if they would only point it out. It has not brought to light one single case.

(A recess was here taken until 2.30 o'clock p. m.)

2.30 P. M.

The committee met pursuant to recess.
Present, the chairman.

STATEMENT OF HENRY ELLSWORTH.

HENRY ELLSWORTH, being duly sworn, testified as follows:

Direct examination by the CHAIRMAN:

The CHAIRMAN. What is your name?

Answer. Henry Ellsworth.

The CHAIRMAN. Your residence and occupation?

Answer. Chicago. My business is commission business.

The CHAIRMAN. General commission?

Answer. No. It is almost wholly handling meats and provisions—buying and shipping provisions.

The CHAIRMAN. We have had considerable evidence before this committee, Mr. Ellsworth, as to the desirability or nondesirability of the use of the preservative known as borax, or what are known as boron preservatives, products of borax. The committee is investigating what, if any, food products are deleterious to health.

The WITNESS. Yes.

The CHAIRMAN. I wish you would state your experience and your information, as unbiased as may be, in view of the fact that you are engaged in that business. The committee would like your judgment as to the use of borax.

The WITNESS. I have been in the business of shipping meat for fifteen or twenty years, and we always—we don't think we could ship meats except they were shipped in borax; and the experience I have had has always been satisfactory where meats were so packed. I shipped just a short time ago by mistake a shipment of hams, I think it was, to Bristol, and half of those hams were by mistake packed in salt and the other half were packed as they should have been for shipment. The whole shipment should have been packed in borax. The hams that went over in salt got out of condition and the shipment was refused, and I had to pay the claims against it. The borax meat went all right and always does. We have never had any trouble with meats that were shipped in borax yet.

The CHAIRMAN. Do you feel that it is so important that it is absolutely necessary to it?

Answer. I don't know what we could do without it. I don't think we could do anything without it at all. I would not know what to do if we could not have borax to pack these meats in.

The CHAIRMAN. How long have you been using it?

Answer. Fifteen or twenty years.

The CHAIRMAN. Your shipments are quite large?

Answer. I ship a good deal of stuff; yes, sir. We are shipping every week and almost every day.

The CHAIRMAN. Did you ever hear directly or indirectly of any complaint as to the healthfulness—

Answer. I never did. I am surprised that anybody should say anything against borax. I use it in my house for washing my teeth and my eyes and for bathing and for everything. I can not understand how people can get along without the use of it. I have had a good deal of trouble with my eyes, and for years I had that trouble until I got hold of borax and used borax and water on them, and I never

could get along without it at all; and now every time that they give me any trouble I use borax and water and it cures them right off, and I have no more trouble with them.

The CHAIRMAN. When you get orders from the old country do your orders specify that borax shall be used to pack the meats in?

Answer. They stipulate that the meat shall be packed in borax, yes.

The CHAIRMAN. Now, when you say packed in borax—the borax is used, I understand, after they have been preserved in salt?

Answer. Yes, sir; after they have been cured.

The CHAIRMAN. Salt cured?

Answer. Yes, sir; salt cured. I say cured—they are most always shipped before they are fully cured. It is not fully cured when it is shipped out.

The CHAIRMAN. But the question of curing goes on?

Answer. Yes, sir; this meat is taken and put into a box and rolled around in the borax, and the borax is rubbed all around the piece. Each piece is thrown into a box, and there is borax in that box and it is rolled about in there, and this borax is rubbed all around these pieces of meat, and then it is taken out of the box and another piece put in and treated the same way.

The CHAIRMAN. What percentage of waste, say in a package—you send them out of about 500 pounds weight?

Answer. About 500 pounds to the box.

The CHAIRMAN. About how many pounds of borax would get into that 500 pounds of meat?

Answer. I don't believe I can answer that question. We always have a barrel of borax setting there, and we throw these pieces of meat into that box and use whatever we can rub around that meat.

The CHAIRMAN. Some one has testified that they took in somewhere from 5 to 6 or 7 pounds. That is about $1\frac{1}{2}$ per cent or less.

The WITNESS. I should think there would be that. Yes; I should think there would be that much.

The CHAIRMAN. Do you think it really goes into and penetrates the meat, or is it washed off before it is used?

Answer. No; I don't believe that that goes into the meat.

The CHAIRMAN. It rather retains its place on the surface of the preservative?

Answer. That is what I think it does. I think it preserves the meat and keeps the pickle in the meat and the pickle cures the meat, and this borax keeps the pickle from running out of the meat. That is my opinion.

The CHAIRMAN. Do you use any salicylic?

Answer. No, sir.

The CHAIRMAN. What else do you use besides borax?

Answer. We never use anything but salt. I never have had any experience except with salt and borax.

The CHAIRMAN. And that does the work to your satisfaction?

Answer. We never have any trouble.

The CHAIRMAN. And to the satisfaction of your customers?

Answer. Yes, sir. My agent from Bristol is here now. You might have a talk with him if you like. He just came in town this morning. He could tell you as to how the meat turns out over there and what they do with this meat after it gets over there as to the borax. I could have him come over if you would like to talk with him.

The CHAIRMAN. You understand that the general trade is engaged in the same work?

Answer. I know they are. Nobody else thinks of doing this busi-

ness in any other way. There is no dealer or packer that does not do the business in the same way.

The CHAIRMAN. How much is shipped out of this country?

Answer. There is an enormous amount; I don't know how much; I should say about a train load every day.

The CHAIRMAN. You would not undertake to make it satisfactory to the customer without the use of borax?

Answer. No, sir. I know if I had an order—in making a shipment to-day, if I shipped out fifty boxes of meat to-day and I should pack it in salt, I would have it refused on me, and I would have to pay my draft and take care of my meat over there at a big loss. I would have just the experience that I spoke to you about the other day.

STATEMENT OF WALTER H. ALLPORT.

WALTER H. ALLPORT, being first duly sworn, testified as follows:

Direct examination by the CHAIRMAN:

The CHAIRMAN. Will you give your full name, your profession, and your residence?

Answer. Walter H. Allport; physician and surgeon; 85 Rush street, Chicago.

The CHAIRMAN. State briefly, Doctor, your training for your profession and your experience for the past—

Answer. I was educated at the University of Michigan and at the Chicago Medical College. I was house surgeon at the Cook County Hospital for a year and a half. I was then resident surgeon for the Northern Pacific Railroad in their hospital for two years. I was then surgeon to the Illinois Central Railroad, assistant attending surgeon, and have been such for the last nine years. During that time I was also surgeon to the World's Fair for three years; surgeon for two years to the Cook County Hospital of this city; I have been attending surgeon at St. Luke's Hospital for eight years; taught anatomy at Northwestern University for five years. I am at present assistant superintending surgeon to the Illinois Central Railroad and surgeon at St. Luke's Hospital.

The CHAIRMAN. In the meantime you have carried on a very extensive practice in medicine?

Answer. Yes, sir.

The CHAIRMAN. And have made this subject of food for the human stomach a study, as every physician has made?

Answer. I have made the study of antiseptics a particular study.

The CHAIRMAN. This committee is investigating, to report to the Senate of the United States, what of the prepared foods are deleterious to public health; and there seems to be some little conflict of opinion as to the use of certain antiseptics. I would like to inquire, first, as to your opinion as to the use of borax.

Answer. I consider borax and boric acid identical in their antiseptic effect. Boric acid is the pure acid. Borax is a salt of boracic acid. Borax is made by the addition of boracic acid or boric acid to carbonate of soda, the supposition being, of course, that both ingredients are pure; and what I will say will be based entirely on the chemically pure character of either borax or boracic acid and the carbonate of soda, from which the borax is made. Borax is made by the addition of chemically pure boracic acid, in the proportion of about 100 parts to 120 or 130 parts of pure carbonate of soda. The carbonate of soda is dissolved and the boracic acid added to it; it then slowly crystallizes

and we get the large crystalline compound known as borax. This borax is used either in the crystalline form in the manufacture of certain alkaline products—it has a mild alkaline reaction and is used in the manufacture of soaps. It is used in the preparation of milk, sometimes in order to preserve it, and its use is allowed by some of the governments of the world, notably the Governments of Sweden and Norway and Denmark.

It is used also in medical practice, in eyewashes, in mouth washes, in washes for the stomach, in washes for the bladder, for the vagina, and for the rectum. In other words, it is used wherever we wish a mild alkaline or antiacid wash, the chief features of it being its mildness and its alkalinity and the fact that when used in large quantities it has no appreciable result on the system, except to render it somewhat more alkaline. The value of a soda salt, considered as a soda salt—and I would class among those soda salts the bicarbonate of soda, the chloride of sodium, the borate of sodium, the bromide of sodium, the iodide of sodium, and, possibly, some other soda salts that I have not classified or enumerated—lies in the fact that soda is a normal ingredient in the alkaline blood, a normal ingredient in the system. It is present in the blood, which is mildly alkaline in reaction. It is present in the urine, which is mildly acid or neutral in reaction. In fact, it is present in nearly all the secretions of the body.

Soda, therefore, used in moderate quantities, is preferable where we wish mild salts; and I would say, as an illustration of that general statement, that physicians, when they wish to give a mild bromide, give a bromide of soda in preference to a bromide of potash. Where they wish to give a mild iodide, for its alterative effect, they give the iodide of soda in preference to the iodide of potash. By that I will call your attention to the mild character of all soda salts, and I think that rule holds good through the domain of chemistry; that is, that soda is a normal ingredient of the body. Potash acts, when it does act, as a violent alkali, and decomposes the blood corpuscles, so we may tell the patient who has been taking some salt of potash—and I would enumerate among the salts of potash as used in the preparation of foods particularly the bicarbonate of potash, which is used as an alkali; the nitrate of potash, which is used as a normal, recognized preservative ingredient in the preparation of hams, and bacons, and other—

The CHAIRMAN. Saltpeter?

Answer. Yes, sir; saltpeter, or nitrate of potash. That, salt for salt and weight for weight, the soda salts of the various acids, the iodide of soda, the iodide of potash, the bromide of soda, the bromide of potash, the carbonate and bicarbonate of soda, and the carbonate and bicarbonate of potash—that the soda salts are three or four parts more harmless. That is, the normal dose of bromide of soda is, say, 40 grains; the normal dose of bromide of potash is 10 grains; and so it goes on through the domain of chemistry.

The soda salts, then, I consider more harmless—in fact, in the majority of cases, almost entirely harmless, except when used in very extensive doses, because the soda contained in them is a normal ingredient in the blood.

Now, I say that applies particularly to the use of borax. We have no borate of potash that I am familiar with, and the reason is this, perhaps explaining the whole thing in a nut shell: Boric acid is an exceedingly mild acid, one of the mildest acids that there is known. It unites with very few alkalies. We have no borate of ammonia,

no borate of potash, because the boracic acid is not strong enough to unite with the potash. It is, however, strong enough to unite with the mild soda; so, therefore, we have borate of soda, and that is nearly the only salt of boric acid, because of the mildness of the boric acid.

Considering that borax is a salt simply of boric acid, and that it depends for its virtue not on any unknown or undeveloped property but on the property of the carbonate of soda on the one hand and on the boric acid on the other hand, and that it can develop no new properties except such as come from the alkalinity which it derived from the carbonate of soda, I say that borax may be considered as identical in its chemical effect, and its effect on the system, with the boric acid itself.

So that brings us to the discussion of the properties of the boric acid, and I think fairly and logically, since the only difference between the two lies in the mild alkalinity of the borax and the mild acidity of the boric acid.

Boric acid possesses antiseptic properties, and is somewhat acid in its reaction. It does not, in my opinion, retard digestion, for the reason that substances whose products are purely antiseptic or disinfectant and which do not possess any corrosive action, as a rule, aid digestion, because they destroy the usual deterrents of digestion—bacteria. Any substance which would limit bacterial growth increases the digestive properties of the gastric and intestinal juices, and so, in many forms of acid dyspepsia, boric acid is given in large doses, from 5 to 10 grains. And I would draw your attention particularly to the fact that boric acid can be given in 5 or 10 grain doses.

The nitrate of potash—which is not considered harmful—which is used constantly in the preparation of foods, can only be given in from 2 to 4 grain doses; so that you may give safely 10 grains of boric acid, while you may give safely only from 2 to 4 grains of the nitrate of potash, the latter being recognized as a proper and usual disinfectant. When boric acid is taken into the system, as almost all of these drugs are eventually, it circulates as boric acid—that is, it passes through the blood, rendering it mildly antiseptic, yet not, however, interfering with any bacteria residing there. It is eliminated through the kidneys as boric acid also, and we get its principal value in surgery as a disinfectant of the bladder—that is, where administered internally. I have given from 5 to 10 grain doses eight or ten times a day, or as often as appeared to be necessary, in cases of cystitis—that is, inflammation of the bladder—and have had from this no result except to render the urine mildly acid from the presence of the boric acid. No harmful results, although I administered during a day's time from 1 to 2 teaspoonfuls of the acid. That I consider a demonstration of the harmless character of boracic acid.

In other cases it is used as a wash for the vagina, a disinfectant again; also as a wash for the uterus. The crucial test, I consider, of the harmless character of this antiseptic lies in this, that we may wash out the peritoneal cavity, in case of peritonitis, with a saturated solution of boric acid. We may wash out the pleural cavity, in cases of pleurisy, again, with a saturated solution of boric acid. We may wash out the bladder with the same. We may wash out the stomach with the same, the vagina and the stomach with the same, and without fear of serious consequences; and we may leave as much in any of these organs or tissues as seems to be necessary for its antiseptic values. That is to say, its properties seem to be purely antiseptic.

There is no case definitely known to me in which boric acid has produced poisonous results. I know that cases have been recorded where large quantities of boric acid have been used; but I have not met in my own practice, nor within my own immediate range of observation, any cases of poisoning by boric acid.

In operative surgery the acid is used on wounds in, I may say, enormous quantities. In the hospital where I work—and in other hospitals also, because our practice is not unusual in that regard—we use a large box made of glass, such as is used by housekeepers and cooks in sifting flour; an ordinary flour or sugar sifter, with large openings; and after a wound has been made and stitched up again, it is covered with quite an amount of the boric acid, in some cases as much as half an ounce being used on a large wound. A dressing is then applied and the patient is put to bed. Sometimes the dressing stays on from six to fifteen days without being disturbed. The wound is then dressed, and the skin is found absolutely unirritated—and I would lay particular stress on that. The boric acid is dry and caked on the surface, is unchanged in its chemical quality, except that it has taken up some of the secretions and has done nothing except to render the wound aseptic and aided in its healing.

In extensive burns—and I think it is of value for you to know this—since a burned surface absorbs large quantities of harmful drugs—that is, morphine, cocaine, atropine, iodoform (and I say particularly iodoform) dusted on the burned surface absorbs with remarkable rapidity—boric acid dusted on a burned surface has absolutely no effect on the system. It produces nothing but the cessation of germ life in the wound. What I say may seem somewhat ex parte. I am an advocate of boric acid. I believe in it. I have tried every antiseptic known to me—iodoform, carbolic acid, lysol, creolin, corrosive sublimate, bismuth, iodol, and aristol—and I know absolutely of no medicament that is so harmless, so productive of benefit, to the system by the extirpation of germ life as boric acid.

The CHAIRMAN. What is your opinion as to the use of boric acid for putting over pork after it has been cured, or partially cured, by salt?

Answer. Do you refer to the placing of it on the outside of the meat?

The CHAIRMAN. Yes.

Answer. I would say there should be absolutely no opposition to the use of boric acid in that way. It is tasteless and harmless.

The CHAIRMAN. I think that is all, Doctor.

The WITNESS. I would like to add this further—

The CHAIRMAN. Yes; if you have anything further to suggest, you may do so.

The WITNESS. In the course of my investigations I have found one or two facts which, I think, may be of interest and of use to you.

The CHAIRMAN. We will be very glad if you will give them.

The WITNESS. The ordinary saturated solution of boric acid is $2\frac{1}{2}$ per cent. That is, if we add a teaspoonful of boric acid, or rather three teaspoonfuls of boric acid, to a pint of water, we get a saturated solution, and in that form it is used in the form of a bladder wash, a wash for the stomach, the rectum, the vagina, etc. It is very probable that when it is used in these cases a good deal of it is absorbed. I should say, perhaps, if we give a patient an enema of boric acid of a pint, possibly the patient might take up a teaspoonful—that is, a dram—of the medicament. I have never seen any harmful results. The benefit, I think, which would come from the use of boric acid, in opposition to other antiseptics, lies in the fact that it disappears almost entirely when the substance is treated with water.

Let us take, for instance, butter. The ordinary cook washes her butter before she uses it. If she does not, she should. The boric acid used in the preparation of butter—and I understand it is used in the preparation of butter as shipped from some countries into Great Britain—some butters containing $1\frac{1}{2}$ per cent of boric acid. Grant that there may be some mildly deleterious properties to the acid—which I don't grant except for the sake of the subsequent demonstration—boric acid can be absolutely removed from the butter by means of careful washing; so that is an advantage. The treatment of hams and meats in the same way, I think, is proper, since boric acid again, by washing the substance, can be dissolved and removed entirely, even though it may have been for a long time in contact with the meat or substance. So I say that its solubility, as compared with other drugs—salicylic acid, which is permitted, I believe, by law to be used in the preparation of certain foods, and not permitted in the preparation of others. It is very insoluble. Granted that salicylic acid is injected into the butter or meats; once resting there, it can not be washed away or taken out or dissolved in the water which is used to wash the substance with. The same is true of formaline—and I may say this, that as between formaline—

The CHAIRMAN. Formaline?

The WITNESS. Yes. Has that come before your committee yet?

The CHAIRMAN. I think we had it mentioned by some of the scientific gentlemen. Is it a product of wood alcohol?

Answer. Yes, sir; it is made by the action of some acid on wood alcohol. With a thought I could state exactly how it is made, but it is made from wood alcohol anyway, and it is used in treating meats and bodies. I have, in my work in anatomy, used bodies injected with formaline, and this I would call your attention to. I injected a body some time ago with one-fourth solution of formaline. That is, it comes in liquid form, known commercially as formaldehyde or formalose, it being a solution of formic acid. I injected this body with a one-fourth solution in water of the formaline itself. Within twenty-four hours the body was absolutely rigid, as hard as a board. You could strike it and it would give out a note such as you get from a hard body.

On cutting into the body and removing the skin, the muscles were found absolutely stiff, so stiff that you could take a long muscle, such as—the biceps I suppose you are more familiar with—you could take hold of one end and hold it up in your hand, and the other end would stick out like that [indicating a straight line]. The vapor of formaline is very irritating. When it gets into the nose or mouth or throat it causes sneezing, and it causes intense conjunctivitis when it gets into the eyes. I don't think a preparation of formaline could be made so mild as to be harmless in the preparation of foods. It has been said that the vapor of formaline applied to meats would render them so that they could be marketed. I will state some experiments which we made with formaline, which may be of interest to you.

We found that by vaporizing formaline—that is, by burning it in a dish, or atomizing it—it would penetrate through 4 or 5 inches of ordinary cloth stacked up in piles—that is, a pile of shirts or a pile of undershirts. Some clothing had been put into a car and sent South for the purpose of being retailed. The car came in contact with yellow fever and was sent up here to be fumigated. It was disinfected with formaline. We found that for a depth of 4 or 5 inches the formaline vapor penetrated that cloth. The same property would

exist in treating meats and in treating various food products; we get the formaline penetrating the food or whatever we wish to disinfect.

It would render it absolutely distasteful to the individual. Not only distasteful, but I think it would render it very difficult of digestion. So that I say I do not consider that formaline in quantities sufficient to render it disinfectant would be harmless. I don't think it should be used on products intended for use as food. I would say the same in regard to many other disinfectants or antiseptics. One is the treatment of meat by sulphur vapor. We get the sulphur combining on the outside of the meat to form sulphides, and you get a hard cake on the outside of the meat from treatment with sulphur. That does not penetrate. It has been said that sulphur vapor on that account is not of value, since it does not penetrate. As between formaline, salacylic acid, carbolic acid, corrosive sublimate, and boracic acid, I should say the treatment by sulphur was next in value to the treatment by means of boric acid; but I consider that boric acid, even injected—in embalming the body of a sheep or cow with boric acid injected into the arteries—would be safe as compared with any other method of embalming or preserving of meat, and considering the fact that it can be washed out and that it does not form any chemical product with the acids or alkalies of the tissues—it comes away unchanged—that it would be safe to use.

The CHAIRMAN. What would you say as to a comparison between borax or boric acid and common salt? Which would you say is of the greater value?

Answer. Of the greater value as a disinfectant?

The CHAIRMAN. No; as a meat preservative, the least harmful.

Answer. Well, I should say, Senator, they stood side by side. It is a fact that the administration of any large quantity of an alkaline salt is harmful to the system, and we get the same evidences of harm in the exhibition of large quantities of common salt that we would from any other mild alkali—that is, we observe the well-known scurvy, which comes to individuals from eating salt meat. We would not see scurvy any quicker if we ate borated meat, and the probability is that we would notice it a good deal less rapidly—that is, I consider, weight for weight and quantity for quantity and use for use, it is more than equivalent to common salt.

The CHAIRMAN. We also have refrigerating processes. Is that entirely free from danger, so far as you know?

Answer. Refrigerating processes?

The CHAIRMAN. Yes. Is that free, do you think, from any danger, any more free than this process which has been described?

Answer. Why, that would lead me a little outside of my knowledge of the preparation of foods. I can say in reference to refrigerative processes as applied to the bodies which I have used in dissections that where the refrigerative process is properly applied and continuously applied the body comes out of the deadhouse—that is, out of the cold room—in as good condition as it goes in; but the danger lies constantly in a change in temperature. Granted a continuous cold—that is, a cold down to 32 or 33, or possibly 30—well kept up, until your quarter of beef or ham, or whatever you use, came out of the cold and was then distributed, I should say it was a good process; but it meets with this objection, that you must consume the meat as soon as it is removed. The body must be dissected. We bring our bodies up into the dissecting room immediately from the deadhouse. The students are allowed five weeks for the purpose of dissecting. At the

end of five weeks what is left of the body is practically liquefied. The muscles run off in a kind of fat or soapy substance. They do not retain their identity. Now I see they treat bodies with boric acid, and the boric acid is used in the embalming process, in the preparation of our bodies; the bodies come out better, in better form. The muscles are more natural in their shape and color and in their consistency; and so I say that the borax treatment, by means of boric acid, would be better, since the meat can be taken a farther distance outside the refrigerator and eaten more safely afterwards. The danger lies in refrigerating that the meat should be tainted after it has been removed from the refrigerator.

The CHAIRMAN. Have you any general views on this subject other than what you have given? I am interested from the committee's standpoint?

Answer. I think I have embodied what I have to say already in my statement. I always have been and always shall be a very warm friend of the boric acid used in my own branch of medicine, as used in anatomy, and used, without any great experience, in the preservation of meats, since all decomposition or preservation depends upon the existence or nonexistence of bacterial life and the destruction of this bacterial life.

The CHAIRMAN. You have no connection with any commercial interest, with any boracic-acid enterprise, have you?

Answer. No, sir.

The CHAIRMAN. Your interest is from a scientific standpoint?

Answer. I am interested in these things purely from a scientific standpoint.

The CHAIRMAN. I think that is all, Doctor.

STATEMENT OF C. F. HANES.

C. F. HANES, being duly sworn, testified as follows:

Examined by the CHAIRMAN:

Q. What is your name?—A. C. F. Hanes.

Q. What is your residence?—A. Chicago.

Q. What is your occupation, Mr. Hanes?—A. Salesman for the Battle Creek Health Food Company.

The CHAIRMAN. Mr. Hanes, I have called you as a witness. This committee is investigating with a view of getting all the evidence we can upon the question of pure foods, and we are to find out what is deleterious to health and what goods are sold fraudulently and what are simply frauds upon the people and what are deleterious to health. I knew, through acquaintances, that you had a specialty in the way of pure foods. I do not know that it can be used in the matter of drafting a law, but I would like to have you give your ideas to the committee upon the question of pure foods, either from a legal standpoint or from an ethical and moral or physical standpoint, and we can see what we can do with your evidence after we have heard it.

Answer. The Sanitarian Health Food Company makes a peculiar line of foods, differently, possibly, than most of the manufacturers of foods in this country, and they are called health foods for the reason that they aid digestion and are partially digested. Probably that is the main difference between our foods and the ordinary class of foods, that they are made so that they can be easily digested. And all our

goods, put up in packages, are ready for immediate use without undergoing any process of cooking.

Q. Are all your foods ready cooked?—A. All of our foods are ready cooked, ready for immediate use, with the exception, possibly, of one or two; but the majority of them are cooked. In fact, all of them are put up and are ready for immediate use. We have one food particularly, made from wheat—granose biscuit—which has undergone a thorough cooking, and then it undergoes a process of manufacture that rolls out the wheat into a small kernel, so that it is absorbed almost immediately into the blood. [The witness here produced a sample of granose biscuit.] Each one of these little flakes is a kernel of wheat already cooked. The starch is converted into dextrine. Another point is that the Battle Creek health foods are made especially for the class of people that you would call dyspeptics, people who can not digest ordinary foods in the ordinary method. These are very easily digested.

Q. Is that the whole wheat kernel?—A. Yes; just as it comes from the thrashing machine, with the outer hull taken off. It has undergone a cooking and a toasting process. It is twice cooked.

Q. Is that the company of which Dr. Kellogg is president?—A. Yes, sir; he is the inventor of these foods.

Q. And he has personal knowledge and supervision of their manufacture?—A. Yes, sir. Everything that goes out is one of his inventions. He has quite a large library there on hygienic foods.

Q. Do you use any antiseptics at all or any preservatives?—A. No, sir; not that I know of.

Q. No formaldehyde or boric or salicylic acid?—A. No, sir; not that I am aware of.

Q. It preserves itself, does it?—A. It preserves itself. This food [referring to a sample of granola] is made from a combination of grains of wheat, corn, and oats.

Q. Let me ask you another question. I see this is marked as a mixture of wheat and other choice grains. Do you on every package that you send out mark the contents as they are?—A. Yes, sir.

Q. That is the intention?—A. That is the intention. I think every one of our packages is marked just what it contains. That food (granola) is different from this (granose). This (granose) is manufactured by a process that is entirely different.

Q. How do you keep each flake separate? They are rolled instead of ground?—A. It is a patent process which Dr. Kellogg got up himself of rolling the wheat berry out into a flake.

Q. Have you any of these flakes that are not cooked into biscuit?—A. I have not any; no. We do not put any out. We have the same thing loose instead of—

Q. That is what I mean.—A. The same thing loose. I did not bring a package of that down. It is the same thing, only not put up in biscuit form. It is already cooked, a granose flake.

Q. Do you prepare any meats at all?—A. No, sir. No meats except nut meats. We have a line of nut foods which is rather new to the market, and possibly you might be interested in those.

Q. What are those nut meats made of?—A. Usually a combination of different nuts. We have a combination also of nuts, cereals, and fruits, combined into one food, which Dr. Kellogg claims is a perfect food; that is, it has all the elements in it to sustain life. [The witness here produced a sample of the food referred to.] That food there [referring to same] with water would be sufficient for any individual

to live on and live well, as it has all the elements of nutrition and in the right proportion. Bromose [referring to a sample]. That is composed of figs, a combination of different nuts, and the gluten of wheat. We also make them in different flavors. Possibly some people would not like the fig flavor or taste in it. It absorbs immediately into the blood. It is a predigested food.

Q. What kind of nuts do you use?—A. We use the peanut to a great extent and the almond. I understand, though, that they use the filbert and hazelnut considerably. We also use the cocoanut to some extent. We have other cocoanut preparations, of which I have not a sample here, in which cocoanut predominates. This [referring to another sample] is an entirely different product again of the nut foods, and it is what Dr. Kellogg designates as a substitute for meat. He has tried to get a food which would taste similar to meat.

Q. There is no animal oil in it at all?—A. No animal fats contained in any of our foods. It is a vegetable fat.

Q. This is a substitute for meat and is—A. Made from a combination of nuts. Just in what proportion he makes it I do not know.

Q. Does all this oily and meaty taste come from the nut?—A. Yes. There is not a particle of animal fat in it. We have something like thirty-five different lines of foods. It is on account of people's tastes. Some people like one kind and some like another.

Q. These foods that are prepared under the direction of Dr. Kellogg are not only easily assimilated, but they are nutritious?—A. Yes, sir; the highest degree of nutriment. The Doctor contends that nuts have a higher degree of vegetable fat than any of the other foods. I brought along another sample here, just lately out from the laboratory. It is baked beans. It is not pork and beans. We taboo the hog entirely down there, but we put the proteose in it. I don't know whether the committee would be interested in that or not. This is pork and beans without the pork. That little piece in there is proteose, only it is baked in with the beans. It gives the bean a nutty flavor. There is a full line of crackers and biscuits made that I did not mention when I was on the subject of the bakery goods, in which we do not use any baking powder, soda, or lard in the manufacture.

Mr. KNIGHT. Do you use butter?

Answer. We use nut butter. We use no animal fats. I have a sample of nut butter there. Probably the committee would like to see it.

The CHAIRMAN. You use no animal fat?

Answer. No animal fats whatever. We used to season our goods with dairy butter, but the last two years we have quit using the dairy butter. [The witness produced a sample of nut butter.] That is nut butter. That is made from peanuts. We roast the peanuts, and we have a mill that grinds them up fine.

Mr. KNIGHT. Do you find any objection to the color of that?

Answer. That is the natural color after the peanut is roasted. Any one can make it himself at home. They can get the peanuts and grind them up. The company is putting up a small mill for the benefit of people who want to make their own nut butter.

The CHAIRMAN. You use no preservative and no antiseptics?

Answer. No preservatives and no antiseptics whatever in any of our food. Dr. Kellogg is so particular about putting anything in to adulterate food that he does not even put salt in this biscuit. By eating a little salt it may make it a little more palatable. It is simply

the wheat berry that is cooked. There is no salt in it. He does not even put salt in it to preserve it.

Q. It is practically as though you had gone into the field and gleaned the wheat and eaten it with the rough shell off?—A. Precisely. There is one other cereal, which is everybody's food, already prepared, which is called crystal wheat. It does not undergo quite the process of manufacture of this granola. It is already cooked, and all that is necessary is to put it in hot water for a minute, which softens it up so that it is then ready for the milk or cream or fruit juice.

Q. There is nothing in that except pure winter wheat?—A. No, sir; pure winter wheat.

Q. Is it cooked in the process of grinding or before?—A. It is cooked before and afterwards, as I understand. The same way with this granose biscuit. It is cooked before—the whole wheat is cooked, steam cooked—and then it is run through this machine, that pares it off into flakes, and then it is put into ovens and baked.

STATEMENT OF FERNAND HENROTIN.

FERNAND HENROTIN, being duly sworn, testified as follows:

Direct examination by the CHAIRMAN:

The CHAIRMAN. State your name, profession, and residence.

Answer. Fernand Henrotin; residence, 353 La Salle avenue; physician.

The CHAIRMAN. Doctor, this committee is working under instructions from the United States Senate, taking evidence on the question of what foods are being sold in fraud and what foods are being sold that are deleterious to public health. In the matter of the preservation of foods, from milk to canned goods and beer and meat, we have found by the examination of a good many scientific men in your profession that large amounts of antiseptics were being used of different kinds, such as salicylic acid, borax, formaldehyde, and salt-peter. I wanted to direct your attention for a few moments this afternoon, and get your opinion generally as to the use of antiseptics, and whether it is a practicable thing, in your opinion, to get along without them.

The WITNESS. Do you want me to give my general observation of the use of antiseptics?

The CHAIRMAN. Yes, Doctor; in your own way, please.

The WITNESS. And their deleterious effect upon human health?

The CHAIRMAN. Yes.

The WITNESS. I don't know as I am competent to give an opinion upon the use of all antiseptics—in fact, I know I am not. I am in a position, from long usage, to give an opinion upon the use of certain antiseptics and preservative substances, and I have been informed that the committee desired my views upon the use of boracic or boric acid and borax as a preservative and an antiseptic.

The CHAIRMAN. Yes; we do.

The WITNESS. And I have had many years' experience in the use of boracic and boric acid and borax, both internally and externally—for it is absorbed when used externally to a certain extent. I believe myself to be competent, particularly, to speak about the use of boric acid. There are various other substances used as antiseptics that are not innocuous by any means. Whether they are used in compounds or in the preparation of foods I am hardly prepared to state.

As regards the use of boric acid, I am perfectly willing to state that I consider the material absolutely innocuous, and able to be taken into the human economy in large and continuous and repeated doses, for great length of time, without a particle of harm resulting, which comprehends about what I know, except to state that my knowledge is based upon an experience of a great many years in using boric acid and borax, both internally, for various forms of disease, and externally, using it every day of my life, I think—for my profession is almost all confined to surgery—as surgical dressings, and applications to the throat, and to the different cavities of the body. I have used boracic and boric acid in, I think, nearly all the cavities of the body. Used it in the large cavities, in the stomach, in the abdominal cavity, in the bowels, in the vagina, in the uterus, in the nasal passages, and in fact almost every reachable portion, and many cavities that are opened and closed afterwards, and never since I have used boric acid have I seen the least deleterious effect of it in any way, shape, or manner, and the same applies to borax.

Judging from my past experience, both by its internal use, giving it as a remedy, particularly as an antiseptic, to the intestinal tract, to the stomach, and from its effect upon the urinary passages when it is eliminated, I consider borax as an article of great benefit, and also boracic acid, to the general country, as far as I can judge. And even in large quantities I have never seen one instance in which I could in any way trace any connection between either any irritative effect or poisonous effect whatever from the use of borax or boracic acid.

The CHAIRMAN. How long have you been practicing, Doctor?

Answer. I have been practicing medicine for thirty-one and one-half years in the city of Chicago, and have always had a great deal to do with hospitals, being connected in such a way that I was brought into constant contact with all sorts of physiological effects of drugs generally.

The CHAIRMAN. What positions do you hold now, Doctor?

Answer. I am now surgeon—what is called gynecologist—and abdominal surgeon at the Polyclinic, and I am also surgeon to St. Joseph's Hospital, and to Alexian Brothers' Hospital, and to the German Hospital.

An adjournment was here taken until 10 o'clock. a m. Tuesday, June 6, 1899.

JUNE 6, 1899.

The committee met at 10.45 a. m., pursuant to adjournment.
Present, the chairman.

STATEMENT OF M. W. HENSHAW.

M. W. HENSHAW, being first duly sworn, testified as follows:

Examination by the CHAIRMAN:

The CHAIRMAN. What is your name?

Answer. M. W. Henshaw.

The CHAIRMAN. Your residence and occupation?

Answer. I live at 432 North State street.

The CHAIRMAN. What is your business?

Answer. I am a dealer in and exporter of butter.

The CHAIRMAN. How long have you been engaged in that business?

Answer. I have been in the butter business since 1871.

The CHAIRMAN. This committee has been investigating questions touching the matter of food adulteration, to find out what foods are adulterated with a view simply to deceive the consumer and what are adulterated with deleterious substances, and antiseptics and preservatives of all kinds have been under discussion. Do you export in your business butter and oleomargarine both?

Answer. Butter only.

The CHAIRMAN. Butter only. What preservatives do you use, if any, besides the usual use of salt?

Answer. Well, I have been unable so far in my experience to get any butter made with a preservative—that is, to any extent. I have been able to secure one or two factories that would do it for me. I did it because it was demanded by my people in England, providing I could get it put up in that manner.

The CHAIRMAN. Do they want a different preservative from what is used here?

Answer. Well, there is no preservative here in general use, except salt. That prevails all over the country. The English trade is becoming accustomed—or, rather, it has become a necessity—to use preservatives in their butter. The colonial butter from Australia and New Zealand all comes with a certain percentage of preservatives.

The CHAIRMAN. All or nearly all of the French butters and nearly all of the Irish butters—what do they use?

Answer. Well, these preservatives. The best of it is borax.

The CHAIRMAN. Do they demand that from you when they make their orders? Do they order butter to be preserved with borax?

Answer. Yes, sir; almost invariably.

The CHAIRMAN. And then, in order to fill that order, you have to get some packer who will pack their butter in that way?

Answer. That is it. But I haven't been successful in doing it—that is universally. Occasionally we would get a factory that would do it. They are very loth to take up any new ideas on butter through the country.

The CHAIRMAN. What effect would it have commercially on our sale of butter, in your opinion, if they would preserve their butter?

Answer. I think it would enhance the reputation of American butter in Great Britain 100 per cent. There is no question about that at all.

STATEMENT OF PROF. FRANK L. JAMES.

Prof. FRANK L. JAMES, being duly sworn, testified as follows:

Examination by the CHAIRMAN:

Q. What is your name?—A. Frank L. James.

The CHAIRMAN. And your profession and location?

Answer. I am a physician. I am editor of the National Druggist, in St. Louis, and have been for a number of years past.

The CHAIRMAN. Where were you educated?

Answer. Under Liebig, in Munich, and at Carlsruhe, in the Grand Duchy of Baden.

The CHAIRMAN. Are you a practical chemist?

Answer. I was, sir, before I had to leave the profession on account of physical disability and also from growing work in another direction.

The CHAIRMAN. I would like to have you state in your own way—we would like your opinion as to the use of antiseptics and preservatives in meat and butter.

Answer. The use of antiseptics in general in the way of food preservatives I have my opinion about, rather adverse to their use; but some antiseptics I favor and favor very strongly. The particular one that I favor most is boric or boracic acid. My attention was called to it nearly forty years ago, while in Liebig's laboratory, as a student. Liebig himself had become quite interested in it, and in that way my own attention was drawn to it. After returning to America I used it whenever I could get hold of it. I was in the Confederate army, and whenever I had an opportunity to get hold of it there I used it for preserving rations, our own mess rations—milk, meats, etc.—and later on I had settled in Memphis, Tenn., and was practicing over in Arkansas, and I had occasion once to be with quite a party of men—sixteen white men, besides the colored drivers of the wagons—and we had to spend nearly five months in those swamps, and in summer, in the Mississippi bottoms, the bottoms of Little River, and I used boracic acid freely as a preservative of fresh meat and milk, etc., whenever we could get them. We could get them very rarely, and to make them go as far as possible I used boracic acid on them. During those five months I hadn't a single day or hour of sickness myself, nor did I have a single man sick. There were no bowel complaints, notably, among them, a fact which I ascribe entirely to the constant use of boric acid. I have used it a great deal myself, personally, for thirty years or more. I may say there is scarcely a day that I don't use it in some way, and owing to the howl that has been made against it of late in journals and among a certain class of chemists and scientists I very recently undertook to discover the source of the prejudice against it. I had long thought that the great Ruler and Maker of all things certainly did not make only one single substance that could be used as a food preservative with impunity—common salt—and that there must be something else just as harmless as it, and I believe that boric acid is that thing.

In the course of my investigations I went back to Germany and France—I mean through literature, not personally—to study the German and French literature. Some twenty-two or twenty-three years ago, when the Australian trade in refrigerated meats began, violent attacks were made against preservatives in the French journals, some scientific, but mostly in secular journals of wide circulation. The most violent of these attacks were made by Professor Le Bon and by Dr. Pelligot, both of whom wrote very powerful articles against boric acid, and these were really the cause of the ban being placed against boric acid in France. Among the Germans there were some few men of lesser note that claimed that boric acid had an evil effect on the digestion, etc., but the arch enemies of it were these men Le Bon and Pelligot. Both of those men, by using it themselves, subsequently recanted all that they had said and became the strongest advocates of boric acid and its sodium salt, borax, as a food preservative. Le Bon and Pelligot afterwards gave certificates to men putting up meats by the use of borax (dusting them with borax) as to its being perfectly

harmless and, in fact, beneficial; and that has been my own experience regarding the matter.

In the course of my investigations I got some literature on the subject, which I would like to present and make a part of the record. This [producing paper] I got published in England, which was sent me at my request, on the subject.

The CHAIRMAN. We will take the book.

The WITNESS. Of course some of the physicians claimed to have had bad results in giving boracic acid for long periods, but if you give common salt—I just noticed in the news from the Klondike yesterday where a party of miners had been compelled to subsist on salted meats, and they had been simply exterminated by scurvy. We might urge the very same thing against common salt that its opponents do against borax.

The CHAIRMAN. Your opinion is, Professor James, that the use of borax or boracic acid is as safe and harmless as that of common salt?

Answer. That is my opinion, sir. Carrying the use of it beyond 2 per cent might be harmful, possibly, but the chief difficulty would be that it would impart a bitter taste to the food. I don't believe, however, it would be hurtful to the health of those who used it.

The CHAIRMAN. While on the subject of antiseptics, what do you think about the use of salicylic acid in drinks?

Answer. I am opposed to salicylic acid, for the reason that I have known in my practice as a physician of so many people who had idiosyncrasies that were not benefited by it, who can not tolerate it even in minute quantities. Besides that, when used to any extent it imparts an unpleasant flavor to the things in which it is used to any extent.

The CHAIRMAN. How is salicylic acid made?

Answer. Well, it can either be made from the natural oil of wintergreen or it can be made synthetically. The natural oil of wintergreen is an impure salicylic acid. I am not sufficiently acquainted with the methods used for the synthetical production of it.

The CHAIRMAN. I think it is from carbolic acid.

Answer. It can be made in that way, but the oil of wintergreen is the great source of it. It is made now synthetically in the laboratories.

The CHAIRMAN. You wish to put in also, did you, an extract from The Grocer of June 4?

Answer. Yes, sir; I would like that to go in as bearing upon the subject. It shows that Professor Attfield, who is to-day one of the greatest chemists in the world, and who has been thus honored by the International Association of Chemists; Professor Bell, and men of that description unhesitatingly indorse boric acid. Attfield speaks of it as "a harmless and most excellent preservative," in the new edition of his Chemistry, the seventeenth or eighteenth edition, I think.

(Said pamphlet is attached hereto, marked Exhibit A to testimony of Frank L. James.)

The CHAIRMAN. This pamphlet [referring to pamphlet hereto attached, marked Exhibit B to the testimony of Frank L. James], contains a report by Dr. Redwood, emeritus professor of chemistry to the Pharmaceutical Society of Great Britain, and reports from Professor Chittenden, of Yale, and the results of elaborate investigation by Professors Chittenden and W. J. Geis, from the Sheffield laboratory of physiological chemistry.

The WITNESS. There is one German investigation there that I would like to especially call attention to, because it is the very latest.

The CHAIRMAN. That is the report of the German association?

Answer. No, sir; here it is [referring to same]—Dr. Kepler, who was the chemist in the German food investigation.

The CHAIRMAN. And Dr. Liebreich also?

Mr. FISHER (assisting the chairman). This pamphlet also contains the report of an investigation by the public consulting health committee of France; a report of an investigation in Russia by the sanitary town council of the city of St. Petersburg; the Chemical Encyclopedia by Berthelot, and others; and the testimony of Dr. Robert Bell, of Glasgow, and also Dr. Bond, senior surgeon to Westminster Hospital, of London; Dr. Pemberton, coroner for the city of Birmingham and consulting surgeon to the General Hospital; Dr. Willington, of Rose Hill House, Handsworth, Staffordshire; Dr. James Richmond, medical officer of the board of health for Handsworth, England; Dr. Alfred Harvey, of London; Dr. Charles Webb Iliffe, coroner of North Warwickshire and Coventry and surgeon to Coventry Hospital, England; Dr. James Hill, physician to the General Hospital, to the Sick and Children's Hospital, and to the Lying-in Hospital, Brisbane, Queensland; Dr. James J. Hues, of Handsworth, England; Dr. J. Vose Solomon, consulting surgeon to the Birmingham Eye Hospital and formerly surgeon to the Birmingham General Dispensary, in England; Dr. Walter Iliffe, of Kendal, England; Dr. J. Woodward Riley, of Shrewsbury, England; Dr. D. R. Wynter, coroner for Central Warwickshire, England; Dr. Bennett May, senior surgeon to the Queen's Hospital and joint professor of surgery in Mason's College, Birmingham, England; Dr. Fred H. Maberly, of Birmingham, England; Dr. A. T. Holdsworth, of Handsworth, England; Dr. S. J. Darby Weston, of Handsworth; Dr. Martin Young, surgeon to the District Hospital in West Bromwich, Birmingham, England; Dr. George H. Hart, of Birmingham, Dr. W. Lawson, surgeon to the Tea Companies in Assam, and Sir Benjamin Ward Richardson and Dr. Brunton and Dr. Bradbury, of England; Dr. J. Steele, medical officer of health, Kidsgrove, England; and Dr. J. H. Ray, resident surgeon officer of the Royal Infirmary, Manchester, England.

Also the report of the German association for the protection of their common interests in the meat and fat goods industry, of an investigation carried on at Cologne in 1898, the report being dated the 25th of October, 1898, and containing the testimony of Dr. Liebreich and others.

An extract from *The Grocer*, of England, of June 4, 1898, containing report of a test case at Ponty-Pridd, Wales, as to the use of American hams cured with boracic acid, which resulted in the complete justification of the American hams as against the Welsh hams cured with salt and saltpeter.

EXHIBIT A TO TESTIMONY OF FRANK L. JAMES.

[Extract from the *Grocer Leader*, June 4, 1898.]

PROVISIONS AND BORACIC ACID.

* * * It is satisfactory to note that the Pontypridd case, by which a good deal of interest has been excited, has resulted in the vindication of borax and a

rebuff—which we hope will not go unnoticed elsewhere—to the prosecuting county authority. This decision affects, of course, merely one case; it is the decision of a local magistrate, not of a “superior court,” and it applies simply to one set of circumstances in which borax was used: but the fact that expert evidence was adduced gives the case a wider importance and justifies, we think, the length of the report which appears in our law columns. The practical curing witnesses called gave it as their opinion very decidedly that it is not possible to produce the mild-cured hams now so much in public demand without the use of boracic acid. This being the case, it is important to know whether boracic acid is innocuous and how much is necessary to preserve hams. The testimony of such well-known medical men as Dr. Bond, of Westminster, and Dr. Bell, of Glasgow, at once settled the first point, and in this they were supported by Professor Attfield, an eminent chemist, the editor of the British Pharmacopeia. From these gentlemen we learn that 1 per cent of boracic acid, or even more, is absolutely harmless; that is to say, if 1 pound of boracic acid were added to and absorbed by 100 pounds of meat, persons consuming that meat would not sustain the slightest injury. Indeed, Dr. Bell, after twenty-five years’ experience of the use of boracic acid in food, said that ham cured with it was far more digestible than ham cured with salt and saltpeter, or nitrate of potash, as he preferred to describe the latter. The innocuousness having been established, a practical bacon curer with more than thirty years’ experience explained that he found from one-fourth to 1 pound of boracic acid was necessary to preserve hams, the amount varying according to climatic conditions, the heat of the meat, and the length of time it would have to be kept; and in this he was supported by Mr. Douglas, a gentleman of great knowledge in regard to bacon curing all over the world. The Glamorganshire county council prosecution rested on the evidence of two witnesses whom it would be absurd to contrast with those for the defense, and the result—that the summons was dismissed with costs against the county—was inevitable. Such a result is highly satisfactory so far as it goes, and we can but hope that very shortly its lessons may be more widely applied in a way to save the trade from unnecessary harassment and the public from improper interference with their food supply.

REPORT OF THE CASE.

Boracic acid in ham: The test case at Pontypridd.—At Pontypridd police court, on Wednesday, Enoch J. Rees, grocer, Gelley road, Ystrad, was charged under section 6 of the food and drugs act, 1875, with selling ham containing 0.6 per cent of boracic acid. Mr. Allen appeared to prosecute on behalf of the Glamorganshire county council; Mr. Abel Thomas, Q. C., M. P., defended, being instructed by Mr. George David (Cardiff) and Mr. Arthur J. Giles. The case had already been before the bench, and had been adjourned in order that a sample of the ham might be analyzed by the Somerset House authorities. A slight discrepancy appeared between the two certificates, and counsel asked which certificate would be dealt with, that of Somerset House or that of the county analyst.

The stipendiary said that of the county analyst would be recognized. He added that if there was any material difference they might adjourn the case.

Mr. Allen said he was quite willing to do that. The difference was between 0.6 and 0.8 per cent, the former being the county analyst’s report and the latter that of the Somerset House authorities. This was a serious difference.

The stipendiary said he did not know that it would make much difference.

Mr. Allen said he could not see what good the Somerset House analysis was unless it was to be acted upon. What was the object of sending to Somerset House at all?

The STIPENDIARY.

Why does not the act follow the process, and make it evidence?

Mr. Allen said that the act was bad as it was, and it ought to be amended.

The stipendiary said that the point was that the article purchased must be of the nature, substance, and quality of the article demanded. There could be no hesitation in saying that the ham was mixed with boracic acid, and he did not suppose that the defense would consider in that sense that the purchaser had got an article of the nature, substance, and quality demanded; but their case rested on their proving that the boracic acid was not injurious to health.

Superintendent Coles said that on March 15 he purchased a sample of ham from the defendant, which weighed $1\frac{1}{2}$ pounds, for which he paid 10*d.*

On cross-examination witness said he was told that the piece of ham given him was what was known as “American cut.” He preferred the mild cured, but did not know to what process mild-cured ham was subjected.

Mr. Alfred Loughton, bacon curer, carrying on business at Llandaff, was then called.

Mr. ALLEN. Do you think it is necessary for the purpose of preparing a ham for the market, as an article of commerce, to use boracic acid?

Answer. I think it is not necessary.

Witness went on to say that it was quite possible to make mild-cured ham without boracic acid. He did not use it in curing his hams. He had tried boracic acid.

Q. Did you find it a successful substitute for the ordinary process of curing?—A. Not for my class of business.

Q. Is it cheaper than your method of doing it?—A. No; it is not so cheap.

Q. Then, may I take it that ham cured in what I call the old-fashioned way, with salt and with saltpeter and sugar, will actually keep longer than one of these boracic acid mild-cured hams?—A. Yes; mine are cured to keep. These are not; they are for quick consumption.

The stipendiary said that the contention appeared to be that the boracic acid was both desirable and necessary for a mild class of ham which was not intended to keep. If that was so, surely Mr. Allen would not object, if it did nobody any harm.

Mr. Allen said that he did not wish to unduly elaborate points, but the bench had it from witness that ham might be cured merely by the old process.

The STIPENDIARY. Possibly; but if other people say this is a better method, suits the trade they are engaged in, and does nobody a particle of harm, you would not object? The whole question comes around the same point: Is this process injurious? It is for them to prove it is not.

Mr. Abel Thomas said that Mr. Allen must prove that the article sold was to the prejudice of the purchaser.

The stipendiary considered that boracic acid was not of the nature, substance, and quality of the article demanded.

Mr. ABEL THOMAS. No more is salt.

The STIPENDIARY. But salt is to a certain extent protected.

Witness (continuing) said that mild-cured bacon without the use of boracic acid would not be the same as if it were borax cured. It would be comparatively mild, but not as mild as the borax or "patent" cured.

Mr. ALLEN. Do you not consider that, for curing hams, salt is quite as effective?

Answer. What we consider is, "what is most salable."

Q. And you find you can put a salable article on the market without boracic acid?—A. That constitutes my experience.

The STIPENDIARY. He sells Welsh hams.

Witness said that an expert could say at once when boracic-acid hams were cooked.

Cross-examined:

Witness said that a Welsh-cured ham was well known in that district. It fetched one of the best prices.

Mr. THOMAS. Would the price be more than 6d. a pound?—A. Yes; it is 9d.

Q. With regard to curing, do you use saltpeter?—A. Yes; it is possible to cure hams with saltpeter or with salt alone.

Witness added that he had never cured hams with sugar.

The STIPENDIARY. Boracic acid is absolutely tasteless, is it not?—A. Yes.

Mr. ABEL THOMAS. In your business, I suppose when you tried boracic acid you found your purchasers did not like it so well as they did the old Welsh cured?

Answer. Quite so.

Q. Do you see any objection to the use of boracic acid except the taste of your customers?—A. I have read a lot of evidence as to this. The only objection I see is from a medical point of view.

Q. And of course you do not know whether it is harmful or not?—A. Neither the one way nor the other.

The stipendiary said it had been proved boracic acid was in the ham, and practically the duty fell upon the defense of proving that it was noninjurious. The prosecution had proved to his satisfaction that the ham bought contained a "foreign" substance, and the bench must assume it to be injurious till the contrary was proved.

Mr. Allen reserved his right to call Dr. Williams, and closed his case.

Mr. Abel Thomas then addressed the bench for the defense. He said that saltpeter was to ham as foreign a substance in every sense of the term as boracic acid. Boracic acid had only been used for the last eighteen or twenty years, whilst salt,

sugar, and saltpeter had probably been used for many generations. But there was no such thing as ham in the sense that they could expect to find something without a foreign ingredient; there could be no ham without such ingredient, as there must be something in the nature of a preservative—of late years they had come to use boracic acid. Now, if the onus lay upon Mr. Allen of proving that the ham was sold to the prejudice of the purchaser, he must show, too, that there was something wrong in the mode of preserving the ham by means of boracic acid. The bench, in calling upon him to prove that the use of boracic acid was not injurious to health, were asking him to do something which was necessary under section 6 of the act. Mr. Allen should have proceeded under section 3 if he wanted to rely upon boracic acid being injurious to health.

MR. ALLEN. I will certainly do it next time.

MR. THOMAS. But Mr. Allen must have said that forgetful of the fact that if he had attempted to prove his case under section 3 we should have had two defenses—one upon the fact that it was not injurious to health, and if that fell through we should have proved by section 5 that the vendor was not liable, because he did not know, and could not have known, that boracic acid was injurious to health at all. The bench knew that one of the aims of modern days was to try and get hams as mildly cured as possible. He knew that in Wales the belief still obtained with those who could afford the luxury that the ham used in their childhood was the best possible. But that was not the current tendency of the age. The demand was distinctly for mild-cured hams, and, as the last witness for the prosecution said, the only way to get mild-cured ham was by the use of boracic acid. It was true that boracic acid was a drug. But there was a good deal of misunderstanding as to what that expression meant. Boracic acid was a drug, and did appear in the British Pharmacopoeia. But so did salt and saltpeter, and pepper and mustard, and tea and coffee. These were all drugs in the same way as boracic acid. Then, again, saltpeter was much stronger as a drug and more dangerous than boracic acid.

THE STIPENDIARY. When you buy ham you may say you do not buy saltpeter and salt—you buy ham.

MR. ABEL THOMAS. You buy the leg of a pig cured by some drug of some kind, and it depends upon the taste of the public what kind of curing there shall be put upon it—what kind of drug they like.

THE STIPENDIARY. Ham, by long use, has come to mean a certain thing.

MR. THOMAS. I was not aware of that. But meanwhile there is this danger. One generally understands by ham the leg of a pig which has been cured by some process. But however much boracic acid you use you must salt the ham just the same, and if you want a particular flavor, however much salt you put in, you must put saltpeter into it.

Mr. Thomas then dealt with the last part of his case, whether the boracic acid was dangerous or not. He said that in no case has it yet been suggested that boracic acid was injurious to health. The case was of vital importance to the whole of the country, for they knew that there were tens of thousands of tons of mild-cured hams and bacon used in this country at the present time.

Dr. Thomas Bond said he was fellow of the Royal College of Surgeons and a lecturer for forensic medicine and senior surgeon at Westminster Hospital. He had for the last fifteen years used boracic acid largely both in surgical dressings and for internal purposes. Externally it was an extremely useful material for all surgical operations, and, of course, when thus used a great deal of it was absorbed by the system. In one extreme case he had kept a child alive in a solution of boric acid for a month. The child had a diseased bladder. He had used the boric acid internally both for hospital and private practice, and he gave the 10-grain dose three times and sometimes, four times a day. He had a patient who had been taking 30 grains a day for months. That gentleman said that he never felt better. He had never found any ill effect except in two cases, where there was previous disease, although he had given boracic acid in hundreds and hundreds of cases. In many hams saltpeter was used, which was a much stronger drug than boracic acid. It acted more definitely on the system. He would rather go on continuously with 10 grains of boracic acid than 10 grains of nitrate of potash (saltpeter). He thought ham cured with boracic acid would be much more easily digested than strong salty hams. He did not think that 0.6 per cent of boracic acid in ham would be injurious.

Cross-examined:

He thought the nitrate of potash was by far the stronger drug. It was difficult to compare the two; the one had the properties of a drug and the other had not. He gave nitrate of potash in large quantities.

Q. Would you prohibit boracic acid entirely to a healthy person?—A. Why should I? Certainly not.

Q. Would you recommend them to take it?—A. No; I should say, "Throw physic to the dogs."

Dr. Robert Bell, of Glasgow, fellow of the faculty of physicians and surgeons, etc., said that for the last seventeen years he had been in the habit of using boracic acid in milk and also in ham and bacon. The average quantity he used in milk was never less than 6 grains per day; frequently 10 grains in summer was consumed by individuals. He had not been able to find out that it had the slightest ill effect on the members of his family. They had been a remarkably healthy family. He had used boracic acid as a medicine very extensively. He generally gave 10 grains three and sometimes four times a day. He would not hesitate to give it up to 20 grains if necessary.

The STIPENDIARY. Would you give 20 grains three or four times a day?

Answer. I would give it without any fear of its doing any harm if the symptoms warranted my doing it, but, generally speaking, 10 grains three times a day answer every purpose.

He had gone on for months and months giving 10 grains three times a day, and he had known instances where it had been kept up for years. He used the acid when fishing in the Western Hebrides. It was quite impossible for him to send salmon home unless the fish was wrapped with coverings saturated with boracic acid. He had done that frequently and without the slightest ill effects. Once decomposition had commenced, boracic acid could not undo it.

Q. So there is no way in which you could conceal badly preserved ham, for instance, or a badly kept piece of pork by using boracic acid on it after it has become affected or tainted?—A. No; it is quite impossible.

Q. Is there any danger in the use of ham or bacon when it is cured by boracic acid?—A. In my opinion, there is not the slightest danger.

Q. In your opinion, would 0.6 per cent be in any way injurious to health?—A. Not in the slightest degree.

Q. Would it be a great loss to the trade of the country if its use were stopped?—A. I am certain it would. It would remove a great source of nutrition from the populace. I would much rather take an ounce of borax than an ounce of saltpeter.

Q. In regard to hard, strongly salted ham and mild ham cured with boracic acid, which, in your opinion, is the more healthy of the two?—A. The mild cured. I would prohibit the use in some cases—certain forms of dyspepsia—of hard-cured ham altogether. I have not allowed my patients to take it.

The witness mentioned an instance in which he used a very large quantity of boracic acid on a woman to remove a tumor. It saved the woman's life.

Q. Supposing the ham was boiled, a good deal of the boracic acid would disappear in the water?—A. Yes; boracic acid is very soluble in boiling water. I knew a gentleman in Glasgow who never had any disease; he would consume at least an ounce of borax every day.

Prof. John Attfield, fellow of the Royal Society, doctor of philosophy, for thirty-four years professor of practical chemistry in the Pharmaceutical Society of Great Britain, and editor of the British Pharmacopœia for the General Medical Council, said he had been familiar with boracic acid in its uses and properties for more than forty years, and it was most certainly not injurious to health as a food preservative. He knew that by personal experience, for, as a dyspeptic patient, he had taken it for many months. He had taken it in doses of 15 grains three times daily, and he had experimented on himself by taking a much bigger dose—80 or 90 grains. He could not tell at all that he had taken it: the system got rid of it with extreme rapidity. It did not retard digestion the slightest degree. He was well aware that boracic acid was used in a great many substances which were required to be kept for a long time, and, as far as he knew, it had not caused any injury to the system of the persons using it. In his opinion, 0.6 per cent of boracic acid in ham could not hurt anybody. Boric acid was found in many substances naturally—in many vegetables which were eaten by animals, in beer and in wines; beer, because it was in the hops, and in wine because it was contained in the vine.

Mr. ALLEN. You said you used boracic acid, but you did it under proper medical advice; that, in your opinion, would be the proper way to take it?

Answer. I am a doctor, but not a doctor of medicine, therefore I should consider it only proper to appeal to my medical advisers as to the taking of what would be, for the time, a drug.

Mr. ALLEN. But I consider you more of a doctor than I am—or the poor devil who went to buy this ham?

Answer. I would not object to the poor devil having such a ham given to him.

MR. ALLEN. It depends on the ham. He (Mr. Allen) believed witness rather liked the old-fashioned ham—wasn't that so?

Answer. Yes; I like them very much, but the point is they don't like me very much.

Witness added that he had never heard of a fatal case through boracic acid.

Dr. James Buist (Cardiff) said he had used boracic acid for some years. He had prescribed it in medical and surgical cases, and he had never seen any ill effects after it; he had seen good effects. He had used it in the case of infantile diarrhea, so that even to children it did good. He did not think that 0.6 per cent of the acid in ham could be injurious to the human system. He believed ham cured with boracic acid more "healthy" than one of the salt hams. Boracic acid ham would be better, because the digestive organs would much more likely be able to cope with it.

Mr. Joseph Edwin Prosser, bacon curer, carrying on business in the North of England, who had been in business for about thirty years, said he had used boric-acid preparations for the past twenty-four years. When it came out first it was sold as a preservative; but for many years now he had known that the foundation was boracic acid. He explained the processes by means of which the ham was got ready. After the pigs were killed they laid them on flags and dusted them over with boric acid, a little saltpeter, and salt.

Q. As a fact, can you cure a ham without salt? It would not be ham; it would be pork.—A. That is what I mean. I could preserve pork, but it can not be ham.

Q. Now, first of all, is the boracic acid more expensive per pound than ham?—A. Well, if you speak of the English ham, then the boracic acid is a bit cheaper. If you speak of American ham the boracic acid would be dearer.

Q. What effect has boracic acid on pork?—A. It preserves the pork with regard to the weight of the pork. When we put it on we find it brings out a sort of fluid—we call it "purging" the ham in the trade—and the ham loses a little weight.

Q. Does it lose weight if you use salt?—A. That depends what kind of ham it is.

Q. Is it a loss or gain to you to use a larger quantity of boracic acid?—A. We use as little as we can, as we reckon it a dead loss to us. We would not use it at all if we could help it.

Q. What governs the quantity of boracic acid you use?—A. The weather, the state of the meat at the time it is cured, and the distance the ham has to be sent away.

Q. Is it possible to have mildly cured ham and bacon without using boric acid?

Witness said they might produce mild bacon with salt, but it would not keep only a few days. The only way they could get mild ham was by the use of boracic acid. From a quarter to 1 pound to 100 pounds was used. He had never heard in the trade that boracic acid made the ham unhealthy, and he did not believe it. He never found it to cause any injury that he could trace in any way. It was not possible to make old hams look fresh by means of boracic acid; they would go on putrefying.

Q. You can only use boracic acid with success when the meat is perfectly good and fresh?—A. Just so; if meat once turns you can do nothing with it. Salt might stop putrefaction, and the more boracic acid is used the more expensive the ham becomes. We reckon the preservative account is the worst account we have on our books. It is a dead loss to us.

Cross-examined:

Q. Do you submit it is not possible to make mild-cured with salt and saltpeter without boracic acid?—A. In my opinion, saltpeter is simply put in for coloring. Very mild-cured hams, American, with boracic acid would keep three months from the time they were shipped. After that period they would begin to dull. If only saltpeter were used, the color would keep all right.

MR. ALLEN. It is a fact, is it not, that all Welsh-cured ham keeps a couple of years?—A. Well, I believe it would keep forever. I have heard so.

Witness said he did not know much about Welsh-cured ham.

Mr. M. Douglas said that from his own knowledge boracic acid had been used as a preservative fourteen or fifteen years, and that to an enormous extent. In fact, with the exception of some Welsh-cured or Yorkshire-cured hams—one or two exceptions of that kind—boracic acid was universally used in the preparation of ham. They were practically familiar with it all over the world. It was not possible to have what was called mildly cured ham except by the use of the acid, and with the exception of the Glamorgan County Council he had never heard any objection made to the use of it.

Q. Have you found out what percentage of boracic acid is used?—A. Yes, one-fourth per cent to 1 per cent. I have seen more used.

Continuing, witness said that he had never found that anybody had been injured by taking boracic acid in ham or bacon. He would not consider 0.6 per cent or 0.8 per cent to be an excessive proportion in the preparation, and would have no hesitation in recommending 1 per cent.

Mr. Abel Thomas said that was the case for the defense.

Mr. Allen said he could call Dr. Williams, the medical officer for the county.

The stipendiary said that up to then, with the exception of one or two matters, there was no evidence to show that boracic acid was injurious.

Dr. Williams, medical officer of health for the county of Glamorgan, said the amount of boracic acid in ham put at 0.8 would be 56 grains to the pound. He took it that a person in ordinary health would consume 6 ounces of ham at a meal, and that would be equivalent to 21 grains of boracic acid. Boracic acid was a drug that did not enter into the human constitution, and he maintained it was a drug like all other drugs, and should only be given to the people who required it under medical advice. He had not prescribed boracic acid. It was a drug, and he maintained that it was wrong to give this quantity of 21 grains to persons without their knowledge when they were healthy.

Q. You do not consider it a food, do you?—A. No, no.

Q. Do you consider boracic acid is part of the ham?—A. I do not think it is.

Mr. ABEL THOMAS. That is for the justices to find out.

Witness said that he believed the effect of using boracic acid in this way with other doses was to produce skin eruption. He could not prove this.

Cross-examined, witness said he knew there was a small percentage of saltpeter in ham. He knew it was used in curing bacon, and he admitted that it was a foreign substance. His knowledge of boracic acid used internally was based on reading, etc.

Q. Would you object if ham contained no more than 1 per cent?—A. I would prefer to have no boracic acid whatever in it.

Q. Then, in your opinion, if there is the slightest trace of boracic acid the man who makes or sells the ham should be prosecuted?—A. No; I do not mean that. I would rather not have any boracic acid in any food at all.

Q. But do you consider that if there is any boracic acid in ham it is adulterated?—A. I look upon it as a foreign expedient. If I ask for ham I expect to have ham. The usual way of preparing ham is by salting it.

The stipendiary remarked that in this case the summons was for selling an article to the prejudice of the purchaser; that was to say, selling ham which was not of the nature, substance, and quality of the article demanded by the inspector under the act. He thought they might take it that when ham was demanded boracic acid mixed with ham was not *prima facie* the article which was demanded. There was a good body of evidence which showed, he thought, that it was desirable to add boracic acid in order to make it an article of commerce, because there was a very considerable demand for this mild-cured ham; and that appeared to be the only practical way of producing the article which was in such request. Then the question arose whether in doing this the defendant had done something which was injurious. This case was very different from the case they had before (the boracic acid in butter prosecution), for there was now a great body of evidence produced to the court to prove that the quantity of boracic acid used in this ham was not in excess of that which was generally used in the trade, and there was also a great body of evidence to prove that the quantity which was consumed even in the course of a day in taking, say, 8 ounces of ham, was not in excess of that which a healthy individual might take. He believed there was abundant evidence adduced that day to prove that 0.6 or 0.8 would not be injurious. The bench were jointly of that opinion. Three doctors and some practical ham curers had been called by the defense, and the effect of the evidence was that the quantity was well within the amount generally used, of which no complaint had ever been heard. The doctors were also called to prove not only their belief that the quantity was noninjurious, but they had themselves taken and administered it in very much larger quantities.

They had been asked whether upon any occasion they had known it to have any injurious effects, and two practicing doctors had admitted that this was so upon one or two occasions, particularly in the case of diseased bladder and disease of the kidneys, which had brought on skin eruption. That was about the whole of the injurious effects the bench had before them that day. He (the stipendiary) did not suppose that if ham prepared with boracic acid was really used as an article of commerce, and in 999 cases out of 1,000 it did no harm, they would be justified in absolutely prohibiting it in consequence of its having, in two cases,

produced mischief to the skin under the conditions described. That was the evidence before the bench. There was no attempt to combat it, except by calling the medical officer for the county, who was undoubtedly a distinguished officer both in education and otherwise; but he told the bench he was not in practice and not in position to combat. That being so, they must dismiss the information.

Mr. ABEL THOMAS. I ask it should be with costs.

The STIPENDIARY. I do not think it should be with costs. This is a test case.

If, said his worship, the evidence adduced that day had been brought forward on a previous occasion, the result probably might have been different.

Mr. Abel Thomas understood the bench had granted costs to the other side in a similar case, and there was surely no reason why the defense here should be differently treated.

Mr. ALLEN. Practically, we had no costs at all.

The stipendiary told Mr. Thomas that if he would send in his bill of costs it would be dealt with.

EXHIBIT TO TESTIMONY OF FRANK L. JAMES.

[A translation. Cologne, October 15, 1898.]

AMERICAN BORAXED MEATS IN GERMANY.

REPORT TO THE MEMBERS OF THE GERMAN ASSOCIATION FOR THE PROTECTION OF THEIR COMMON INTERESTS IN THE MEAT AND FAT GOODS INDUSTRY.

In February of this year the police authorities at Solingen seized a parcel of American hams and induced the court to bring an action against the vendors of the merchandise, both father and son, at Ohligs, to pay a penalty on account of a breach of the food law of the 14th of May, 1897, paragraph 12, Resp. 14. The action was brought in consequence of a public announcement made by the Solingen, respectively Cologne, town council, conveying a caution against the sale of hams prepared with borax and boracic acid, such being deemed injurious to health in accordance with the judgment which had issued from the Cologne law courts.

In view of the fact that American meats had on various occasions been the subject of attacks on account of their being packed in borax, and in view of the continually recurring statements of the opposition press that borax and boracic acid were injurious to health when employed as a means of preservation, which appeared to have actually gained belief among some authorities, our union decided, in formal committee, to defend the above-mentioned action and contribute by the opinions of expert authorities to have the question settled by law whether borax and boracic acid were injurious to health when employed for the purpose of food preservation. On account of the enormous importance of the subject, both from a national and international point of view as far as the meat commerce is concerned, I have ventured in the interests of all to distribute the undermentioned full report of the action and the resulting issue.

Let it be first prefaced that in December of last year two Cologne firms were charged before the local police court on account of selling borax-treated hams. The crux of the subject, namely, the question that boracic acid, respectively borax, is or is not injurious to health when employed as a means of food preservation, was never discussed in that prosecution, as no experts had been called for the defense at the trial. The bench therefore took the injuriousness for granted, but dismissed the accused, presuming that they had been ignorant of its possessing such injurious quality. No doubt the opinion of the magistrates as to its injuriousness had been contributed to in no small measure by the statement of the expert chemist, Mr. Kyll, that the Imperial Board of Health in Berlin had likewise declared meat goods treated with borax as injurious to health. This statement was, as has been demonstrated since, a completely erroneous one, no such declaration having up to this time emanated from the Imperial Board of Health. On the contrary, at the extraordinary general meeting of the analytical chemists of Saxony, which took place at Chemnitz on the 1st of December, 1897, the Government doctor, Professor Von Buchka, declared as member and in the name of the Imperial Board of Health:

"The question of the application and the admissibility of preserving agents is one which occupies a prominent place just now, considerably affecting our interests, and it must not be denied that the settlement of this question is one which from many points of view deserves to rank as of great importance. It is above everything also of the greatest moment that cheap, but at the same time healthy,

means of nourishment for the less favorably situated working populations be provided. In respect to borax and boracic acid, different views are still held, although it is well known that meat imported from America is impregnated with borax and boracic acid. As regards the final decision of the question whether such an addition of borax and the continued consumption of articles of food impregnated therewith is injurious to health, I desire for the present that this be considered in abeyance. At this moment experiments are being carried on by the imperial board of health. They would in any case have to be continued for a considerable time before a conclusive decision can be arrived at."

Had the Cologne board of justice known of the above declaration made by the imperial board of health officer a few days prior to the then trial, they would not have credited the statement of the expert that the imperial board of health had likewise declared borax-treated meats to be injurious to health, and they would certainly not have regarded in their judgment the injuriousness of such preserved meats as proven.

Innumerable and oppressive hindrances to the trade have been the consequences of these lawsuits. On the strength of the verdict, police authorities in various departments issued public warning against the sale of borax-treated meats. The trade thereby found itself forced to replace the packing in borax by means of other preservative agents. Many thousands of marks were wasted over these experiments, and still it has not been found possible to secure an equivalent substitute.

I now come to the actual hearing of the present lawsuit. As has been published in the newspapers, the examination took place on the 29th September, 1898, at the Elberfeld court of justice, and resulted in the acquittal of the accused free of costs.

The attorney for the Crown called as experts: (1) The chemist, Dr. Neuhofer, as witness respecting the qualitative and quantitative presence of boracic acid; (2) Dr. Longhart, of Cologne, as adviser respecting the injuriousness to health, whose previously delivered opinion in a Cologne lawsuit was produced, but who had not appeared, and the lawyer for the Crown, in the course of the hearing, dispensed with the same; further, the surgeon, Dr. Wolf, of Elberfeld; Dr. Berker, of Elberfeld, and Dr. Schulz, member and on behalf of the Royal College of Coblenz.

For the defense there appeared as expert Geh. Medizinalrat, Dr. O. Liebreich, professor of the University and director of the Royal Pharmaceutical Institute in Berlin.

The expert chemist, Dr. Neuhofer, proved first that in the ham examined he had confirmed the presence of boracic acid both on the surface, as also in the interior. The analysis had revealed the presence of 0.366 per cent of boracic acid, so that if a man had consumed one-half pound of this ham he would have taken up 0.915 grams of boracic acid; in a written opinion forming the base of this prosecution, Dr. Neuhofer had declared, as far as its injuriousness to health was concerned:

"In my opinion we are not at the moment in a position to give a decided opinion whether the boracic acid present would have injurious effects."

Verbally he declared, in the course of examination, that it was not a question for him, but it was a question for the medical experts present as to the aspects in relation to health, but he still thought it his duty to say that boracic acid did not belong to ham. On the other hand, it was shown that of the 80 hams that had been seized the chemist had only examined one, and had only used a single preparation in order to determine the quantitative boracic acid present.

Since, however, it was well known, and had been expressly set down by the delegate of the imperial board of health on the 1st of December, 1897, that up to the present no absolutely reliable methods for the determination of boracic acid could be utilized, the chemical opinion expressed here must, at the least, be regarded as not sufficiently well grounded.

To this the attorney for the Crown replied that he had a second chemical analysis which showed about 40 per cent less boracic acid, and this confirmed exactly the opinions expressed by the solicitors for the defense.

In reply to the concluding remark of the expert that boracic acid did not belong to ham, this could be met by the evidence that the butchers' journals and price lists of pickling houses not only daily recommend the application of boracic acid as a food preservative, but also that the German butchers and manufacturers of meat goods used boracic acid in large quantities for purposes of food preservation, and regarded the same as harmless, and up to the present unreplaceable, means of preserving their goods.

In the medical opinions invited by the prosecution Dr. Berger stated that he would regard a ham which contained 0.366 per cent of boracic acid when cooked as absolutely harmless, as during the cooking the greater portion of the boracic

acid would be dissolved. The quantity of one-half pound, which would contain 0.915 grams, eaten raw would also no doubt be quite harmless, but in larger quantities it is quite possible the consumption of such ham might not agree, as already in single doses of six-eighths of a grain, which would correspond with three-fourths of a pound of this ham, sickness had resulted, and repeated doses of four-sixths of a grain had been followed by stomach catarrh and catarrh of the bowels.

Dr. Wolf considered doses of boracic acid in the proportion of one-half grain as harmless, but doses above 2 grains had injurious effects, and wished particularly to emphasize that boracic acid after its application had been left off still continued to exercise effect, and that cases had occurred where patients treated with boracic acid, even fourteen days after the boracic-acid application had been left off, showed traces of the boracic acid in their urine. He added, however, that the accused were no doubt ignorant of its dangerous effects, as it was well known that some of the first authorities—as, for example, Dr. Liebreich—had made experiments on the preservation of articles of food, particularly of fish, with boracic acid, and from these no ill effects up to the present had been made apparent.

The richest material for the justification of the prosecution was furnished by Dr. Schulz, of the Royal Medical College of Coblenz. He quoted from medical literature instances in which the medicinal use of boracic acid had produced ill effects—yes, in a few cases certainly, in very much larger doses than here in question, fatal results had followed. The washing of the stomach and of the bladder with boracic acid in strong solutions for treatment of open abscesses, carbuncle swellings, as also the treatment of epilepsy with boracic acid, had in a few cases been followed by fever, eruptions, stomach catarrh, catarrh of the bowels, inflammation of the kidneys, etc.

With justice, the expert explained that from the police point of view, as regards the question of health, an article of food must be considered injurious if it is injurious when raw, even though it is not injurious when cooked; it was a question whether it was dangerous to health in the condition in which it was sold. In the same way, the quantity could not be limited, and the consumption of over one-half pound be considered injurious while it was permissible to consume up to one-half pound. But less justifiable appears his further explanation, that if in a number of instances, or even if as a rule, considerably larger quantities than those affected here do not cause any ill effects, or have not made themselves noticeable, this would still be no proof of its harmlessness, as when an article of food is consumed by old and young, the weak and strong, the healthy and sick, the individual cases which have shown unpleasant results must decide the verdict, even if these are very much in the minority.

Thus the use of lead, directly it came into contact with articles of food, was absolutely forbidden by law, although the quantity naturally incorporated was an extremely small one and in most cases would no doubt have been free from any injurious effects on the health, but notwithstanding even in such cases the use of lead was forbidden by law. Accordingly the College of Medicine was of opinion that the hams in question, if consumed continuously for some time, might have been capable of exercising injurious effects upon the health.

After the medical professor, Dr. O. Liebreich, had, as already stated, submitted the chemical opinion to a criticism, he dealt with the subject from the medical point of view, and expressed himself opposed to the opinions of the three last-named experts. He stated that at the instigation of Professor Virchow, of Berlin, he had carried on a long series of experiments with boracic acid, and that he had convinced himself that the same proved itself a most valuable preservative, and that in the quantities affected it was quite harmless. Among other things he had preserved sea fish with boracic acid and eaten the same for eight days continuously. Very large dinners had been served with these fish without the slightest unpleasant effects coming to light after. He had carried on experiments with a large number of animals taking the boracic acid regularly for a long period without objectionable consequences having resulted in a single instance.

At the same time had he given rabbits doses of 4 to 6 grains, and that frequently, or had he introduced the boracic acid direct into the circulation of the blood by means of hypodermic injection, unpleasant consequences might well have followed without the same contributing the slightest evidence as to whether the substance in question was or was not of value as a preserving agent. Even if the effects of very strong solutions of boracic acid applied in washing out the stomach and bladder or as a cataplasma on open abscesses had in individual cases been attended with unpleasant results, not only much too large a dose of boracic acid had been applied, far in excess of any that could be called into question for preservative purposes, but besides not the slightest conclusions can be drawn from the effects in the above-mentioned disease cases as to the injurious effects of boracic acid when employed as a preserving agent. Saltpeter has from time immemorial been

employed for pickling purposes. No one would dream of calling it into question, and yet its effects, if applied medicinally, as in the above-mentioned cases, would be of a very serious nature. That the principle should be adopted, however, from a police point of view solicitous about the public health, to forbid the sale of any article of food simply because in the most exceptional cases it exercised unpleasant effects, even if such only occurred when applied in large doses medicinally, would have much too far-reaching consequences. It is a well-known fact that there are many individuals who can not enjoy strawberries, crabs, lobsters, etc., without the same causing an eruption on the whole body, high fever, swellings, etc. If the view expressed by the representative of the Medical College should be carried out, the proper place for all dealers in fruits, crabs, lobsters, etc., would be at the police court. Continuous feeding on pickled meat produces disagreeable consequences, ordinary salt in warm water produces sickness and nausea, black coffee, and ever so many other daily articles of consumption produce in individual cases symptoms of illness; but no one ever thinks of forbidding these articles of food and of imposing a fine in the event of the same being sold: with some people one thing does not agree which others enjoy, and each individual has to be guided accordingly, without calling in the intervention of the police. As far as he was concerned, neither in actual practice nor according to authoritative literature was a single instance known where meat prepared or preserved with borax or boracic acid had exercised injurious effect on the health of any individual, nor even when it had caused unpleasant results; and turning to the other experts, he concluded that he took it for granted the other gentlemen present were equally unacquainted with any such instance, as no doubt in the contrary event they would not have omitted to quote it. It must be remembered, too, that in Germany at least 10,000,000 and in England over 100,000,000 pounds of meats treated with borax were consumed yearly. The quotation with reference to lead was erroneous, since the so-called "lead law" existed which expressly permitted a specified proportion of lead in articles of daily use. Only a short time ago he had expressed an opinion in a court of law that the so-called "crowing cocks," a toy covered with a layer of lead, etc., scarcely exposed the children who played with it to the slightest danger, as if the children were to use the same for many centuries they would not absorb the amount of a lead shot pellet, and as soon as the Gehirnrat professor, Dr. Liebreich, had concluded, the prosecutor on behalf of the Crown decided that the action be withdrawn, and dismissed the accused, undertaking that all expenses incurred should be borne by the State. The bench decided accordingly, while the judge, on the application of the defendant, ordered that the hams which had been seized should be given up to him. The finding reads:

"As the object, namely, its injuriousness to health, had not been proved, and particularly after the convincing expression of Professor Liebreich opposed to the opinions of the medical college, who failed to prove its injuriousness to health," etc.

After the verdict had become legally binding, since no appeal was made by the State attorney, I beg to make the same generally known, it being now established that meat goods packed in borax, such as hams and meats in casks and cases coming from America, are not considered as injurious to health.

(Signed:)

THE GERMAN ASSOCIATION FOR THE PROTECTION OF THEIR COMMON INTERESTS IN THE MEAT AND FAT GOODS INDUSTRY. Manager, G. REUVER.

In an issue of the National Provisioner, dated January 21, 1899, appears the following, on page 20:

DR. LIEBRIECH ON BORACIC ACID.

Dr. C. Liebreich, director of the Royal Pharmaceutical Institute in Berlin, said, at the instigation of Professor Virchow, that he had carried on a long series of experiments with boracic acid and had convinced himself that it was admirably adapted as a food preservative, and in the quantities necessary for that purpose it was quite harmless. He added that neither in actual practice nor according to authoritative literature has a case been known, so far as he was aware, in which food prepared or preserved with borax or boracic acid had exercised a deleterious effect on the health of any individual.

On page 11 of the same issue of the National Provisioner appears the following:

ACID FRIGHT.

It seems that those who would ruin, if possible, our valuable possession—a large and increasing export trade in meat and provisions—are now engaged in making a

flank movement on the public mind with the words "poison" and "acids." The packers have asserted that they used no poisons, acids, nor other chemicals, either in refrigerating or in canning meats. The whole of the Agricultural Department verifies this important statement in every particular. Dr. Wiley, the distinguished chemist of the Government, has purchased in Washington and taken from army stores cans of stuff, analyzed them last week, and found no trace of poisons, acids, or other chemicals. Any serious mind must accept these facts unless some scandal monger is ready to assert that such eminent specialists are corrupt or incompetent. Chemicals were not used in these army meats, our impartial Government experts and chemists say. But suppose that the residue of poisons and chemicals had been found upon analysis, that would in no sense establish the fact that they were used in harmful quantities or that such chemicals were harmful. Every physician uses the deadliest poisons as tonics and helpful agencies upon the human system, and they are not hounded for this because improper quantities are hurtful or even deadly.

Strychnine is fatal in certain quantities as a stomach poison. In proper quantities it is a very healthful tonic. Every physician prescribes it, and traces of it would be found in a patient's carcass were it boiled down, even though used in proper quantities.

Nux vomica is a popular remedy, yet it is a deadly poison when used to excess. So is nitroglycerin. Creosote, which is oil of tar, is prescribed for internal use in pulmonary complaints, yet it is a fatal poison if unskillfully used. Sulphuric acid dilute is a well-known tonic, but in excess it means death. Alcohol diluted is not ordinarily considered injurious, but absolute alcohol is fatal to the stomach which receives it. Muriatic or hydrochloric acid dilute is an aid to digestion. There must be hydrochloric acid in the stomach or there would be no digestion. The natural acid of the stomach is hydrochloric. Salicylic acid is an artificial product from wintergreen, a deadly poison, which is largely prescribed by doctors because of its health-giving properties, especially in rheumatism. Boric or boracic acid is perfectly healthy or perfectly harmless when it is used in proper quantities. Besides, it is an antiseptic and a preservative. The mere fact, then, that an analysis of anything which shows traces of this acid would not necessarily show that it had been used in dangerous quantities. The argument that because a trace of an acid is found the substance is dangerous is illogical. Acetic and boracic acids are harmless as used, so a trace of the presence of either proves no dangerous fact.

In an issue of the Chicago Tribune under date of —— appears the following:

COLORINGS OF FOOD.

Much of the artificial coloring of foods is traditional and not meant to deceive. Thus, candies are colored obviously to please the eye and add to the attractiveness of the confectioner's showcase, and likewise butter and mustard are colored with no intent to spoil their purity.

On the other hand, colorings are often intended to conceal deficiencies. Skimmed milk is colored to give the appearance of richness, dilute alcohol to imitate wine, and acetic acid to imitate cider vinegar. The sanitary chemist is obliged to carefully distinguish between the two kinds of coloring. With candies, mustard, butter, and similar substances the question is the wholesomeness of the color used, but the coloring of milk and spirits is an injury to the purchaser, no matter if the coloring is pure.

Coloring used nowadays is mostly of coal-tar products, of which there are many forms. Germany leads the world in their manufacture. The composition of these colors is complex, and their names long and awkward. There is no good reason for regarding these standard coal-tar colors as unfit for use in food, as the quantity is so small that it does not count. In all probabilities these colors are analogous to those found in flowers, fruits, and seeds. All coal-tar colors are organic and readily decomposed in the system, and therefore they can not act as cumulative poisons.

In an issue of the National Provisioner, dated June 25, 1898, on page 15, appears the following:

THE USE OF BORACIC ACID.

LONDON, ENGLAND, *June 10.*—Since my last advices on the question of boracic acid a case has been decided in the Pontypridd (Wales) police court in favor of one Enoch Rees, a grocer, who was arrested for selling "adulterated" hams containing 6 per cent of boracic acid. The case was ably defended on behalf of the Grocers' Federation.

Dr. Thomas Bond, F. R. C. S., lecturer on forensic medicine and senior surgeon at Westminster Hospital, stated that he used boracic acid in surgical dressing and also administered it internally. The 6 per cent of acid in the ham was not injurious to the human system.

Dr. Bell, specialist, of Glasgow, said for the last seventeen years his family and himself had, without intermission, been using milk and hams containing boracic acid without the slightest evidence of ill effects. He had used the acid very extensively and had given doses of 10 grains three and four times a day, and he would not hesitate to give 20 grains. He thought it would be a great loss to the public if the use of the acid were stopped. A milk-cured ham was much more healthy than a salted one.

The summons was dismissed.

In an issue of the National Provisioner under date of ——, page 27, appears the following:

BORACIC ACID IN BUTTER.

The Birmingham, England, papers published an article recently from Mr. A. J. Giles, in which he controverted statements made at the Sanitary Institute Congress by Dr. Alfred Hill, medical officer of health for Birmingham, respecting the use of boracic acid for preserving foods. Mr. Giles supports the resolution passed at the Sanitary Congress (referred to in our issue of October 29), urging "that investigation by recognized scientific authorities into the effect of preservatives on health be set on foot," and then combats at length the aspersions passed by Dr. Hill upon the use of boracic acid as a food preservative. Mr. Giles says in part:

"I see that Dr. Hill contends that the use of all preservatives should be supplanted by refrigeration. This is impracticable. Take, for example, hams and bacons, of which the United Kingdom imports, roughly speaking, 6,700,000 hundredweight per annum, value about £12,000,000; neither the trade nor the public would appreciate these goods if put on this market under the conditions refrigeration would involve. Again, it is contended that butter is brought from Australia, a distance of about 15,000 miles, without the addition of any preservative whatever.

"Any exporter from the Antipodes will be able to verify my statement that a preservative is generally employed, and I have a cutting before me from the Auckland Weekly News, August 26, received only this mail, quoting experiments carried out at the Camperdown factory, in Victoria, referring to two samples of butter, one put up with preservative and the other with salt, both being placed immediately after manufacture in a refrigerating room. The butter in which the preservative was used came out after a lengthy period in a very superior condition to the other sample, and the paper wisely reminds its readers that even this is not a sound test for commercial purposes, because the butter was put into cold storage directly after manufacture, and examined immediately it was taken out of the cold chamber. Butter destined for the London market does not get such kind treatment. There are breaks before it reaches the consumer, and it is during these breaks that the preservative stands by the butter. No doubt Dr. Hill is aware that the taste of the public has been steadily developing, particularly in the south of England, in favor of mild and unsalted goods. From both Ireland and Normandy an enormous quantity of fresh—that is, quite unsalted—butter reaches the London market to meet the demand for fresh butter, and the addition of a preservative appears essential in order to enable it to reach the consumer in sound and palatable condition."

The evidence against those who say that boracic acid as a food preservative is injurious is steadily accumulating.

STATEMENT OF C. PRUYN STRINGFIELD.

C. PRUYN STRINGFIELD, being duly sworn, testified as follows:

Direct examination by the CHAIRMAN:

The CHAIRMAN. What is your name?

Answer. C. Pruyn Stringfield.

Q. Your profession?—A. Physician.

Q. Where did you graduate, Doctor?—A. Chicago Medical College, now the Northwestern University Medical College.

The CHAIRMAN. Are you connected with any public institutions?

Answer. I am consulting physician to the Chicago Baptist Hospital at present. I have had numerous hospital connections.

The CHAIRMAN. And you are now in active practice as a physician and surgeon?

Answer. Yes, sir.

The CHAIRMAN. We were discussing before the committee the use of antiseptics. Our attention has been directed to two well-known antiseptics, salicylic acid and borax, or boracic acid. What do you say about the use of salicylic acid, Doctor.

Answer. Used medicinally, it is an agent of great value, but as a preservative in beer—I presume you are interested in that?

The CHAIRMAN. Yes.

The WITNESS. It is absolutely harmful and positively detrimental.

The CHAIRMAN. What is the effect of it?

Answer. The effect is that of a depressant of the heart and also of the respiration. It adds increased action to the heart for the first five or ten minutes, but that is followed by a depression which is in many instances absolutely dangerous.

The CHAIRMAN. You don't know from actual experience or analysis whether it is used largely in practice or not?

Answer. Not by analysis; no, sir. But I know from all literature on the subject that it is used as a preservative of beer almost universally. It is certainly a great check to putrefaction. It is a powerful agent in that direction. If a man should drink a pint of beer, he would not get much salicylic acid; but many men will sit down in a beer garden and drink a gallon, perhaps, in the course of an evening. At least some do, and they are very apt to get considerable salicylic acid. If they keep that up for days, they are going to accumulate still more. I have had cases of this kind in my own experience and practice where death has seemed imminent, where the patient has said that he had not drunk anything but beer, but he had been drinking that for several days or a week or two; and I have had cases where death was apparently due to the depression of the heart caused by the use of salicylic acid.

The CHAIRMAN. What do you say about the use of borax as an antiseptic?

Answer. I believe borax to be absolutely harmless, or virtually so.

The CHAIRMAN. Do you give it as a medicine?

Answer. I have given it as a medicine, and I have used it locally as an antiseptic in surgery in large quantities. My own experience has taught me that it is absolutely harmless.

The CHAIRMAN. What is formaldehyde?

Answer. I am not up on that. That is a very recent antiseptic. I think it is made from wood alcohol.

The CHAIRMAN. Do you consider that a proper thing to put in food?

Answer. I would not think so, but my experience is so limited in that line that I would not care to make a statement in regard to it. My impression would be that it would be dangerous, because it is certainly a very powerful germicide, and as such I should proceed very cautiously on that line.

The source of salicylic acid, if you will allow me to revert one moment, explains its danger. Salicylic acid made from the oil of wintergreen, which was formerly the custom, is not as dangerous as the present salicylic acid. The cheap salicylic acid is made from coal tar or some carbolic acid which is made from coal tar, and we all

know that these new antipyretics coming from coal tar are almost without exception great heart depressors.

The CHAIRMAN. I believe that is all, Doctor, for the present. I may want to consult you further.

STATEMENT OF WALTER S. HAINES.

WALTER S. HAINES, being duly sworn, testified as follows:

Direct examination by the CHAIRMAN:

The CHAIRMAN. What is your name?

Answer. Walter S. Haines.

The CHAIRMAN. What is your profession?

Answer. I am the professor of chemistry in Rush Medical College, in this city.

The CHAIRMAN. Have you been connected with that college for some time, Doctor?

Answer. For the past twenty-three years continuously.

The CHAIRMAN. I suppose you know, in a general way, the scope and intention of this investigation. We are trying to report some of the facts as to what foods—mixed and prepared foods—are deleterious to public health, and to-day we are on the branch of the use of antiseptics. You have had, as I remember, very extended experience along this line.

Answer. Yes, sir; I have had quite a good deal of experience in this direction.

The CHAIRMAN. And have been called, as I remember, on the question of the use of poisons and the effect of poisons; and it is for that reason, Professor, that we would like to have the benefit of your opinion to help the committee in ascertaining and reporting what of these antiseptics are useful and beneficial and what are detrimental and dangerous.

Answer. I think it should be stated at the start that the ideal way of presenting food to the consumer, when possible, is without any addition whatever or any treatment of any kind; but in a very large number of cases this is absolutely impossible, and therefore we are obliged to resort to various means of preserving food to prevent it from decomposition. This necessitates the use either of antiseptics or of refrigeration. Refrigeration, unquestionably, is an exceedingly valuable means of preserving food, but it has many serious objections. In the first place, it is expensive; in the second place, the refrigerating means are liable to give out at critical moments and allow the entire material to spoil; and in the third place, and most important of all, it is frequently impossible for retail dealers to have efficient refrigerating apparatus, and it is usually impossible for consumers, especially small consumers, to have refrigerating devices of any adequate degree of efficiency, so that refrigerating to-day is practically out of the question for a large number of articles. We are therefore obliged, of necessity, to use antiseptics for the preservation of food.

I think I may say without the slightest exaggeration that a thousand times more damage has been done by the use of food that has not been preserved, through the generation of poisonous substances (such as ptomaines and the like), from the failure to use proper preserving agents, than have ever resulted from the preserving agents themselves. In fact, I think I put it very mildly when I say that a

thousand times as much injury has been produced by the failure to employ antiseptics—proper antiseptics—as by the use of such proper antiseptics. Cases of poisoning, commonly called ptomaine poisoning, resulting from decomposing flesh of various kinds, are recorded every week or two in every large city, many people dying and many more being made very seriously ill by such food poisons. Therefore, as I stated before, I believe that the damage from antiseptics, whatever it may be, is far less than the damage that has been produced by the failure to use them properly.

It becomes, therefore, I think, almost entirely a question of selecting antiseptics. Some antiseptics I regard as unquestionably harmful. Others are, when used in proper proportions, practically harmless. In this latter category I think we may place common salt, although criticism may be offered respecting its use; saltpeter, concerning which also severe criticism may likewise be offered; and boric acid and its various preparations; and I may say at the start that I believe that these latter, boric acid and its preparations, are, on the whole, to be preferred to the other antiseptics mentioned, for various reasons.

In the first place, they produce less effect upon the articles preserved. Common salt and saltpeter impart considerable taste to meats, and therefore make them less palatable. Common salt and saltpeter affect the fiber of meats disagreeably, especially if an excess of them is used, and make them less palatable and less digestible, while boric acid and its preparations have scarcely any effect if used in small quantity in this direction. Common salt and saltpeter have a tendency to cause the juices of the meat to exude and run away, and very much of the valuable portion of the meat is thus lost. Boric acid and its preparations produce these effects to a much less extent, and the juices of the meats are more nearly retained in their natural condition.

For all these reasons I believe boric acid and its preparations are to be preferred to common salt and saltpeter, if used in moderation.

The toxicity or poisonous character of these substances ought, of course, to be compared. It is true that a certain number of cases have been reported of bad effects from boric acid and its preparations, but upon looking up the records I have failed to find a single case in which these unwholesome results could not be attributed reasonably either to an excessive dose, or to the disease for which the acid was employed, or to idiosyncrasies, or to impurities in the acid used.

As to the first of these matters (the use of excessive doses), it is well known that common salt when used in large quantities, is dangerous, and we have cases of death from excessive doses of it. Saltpeter has caused many deaths; in one publication alone I find a record of between 8 and 10 deaths from it. Boric acid has occasioned fewer deaths than these other two substances.

As to the other modifying conditions that I spoke of, they exist concerning common salt and saltpeter quite as much as they do in regard to boric acid. We have persons who can not take much salt without experiencing injury and we have people who can not take saltpeter without injury. Certain people are susceptible to them; certain people have idiosyncrasies for them as they do for boric acid or for many other articles which are perfectly innocent to the majority of the public.

I think, therefore, considering the subject in these various lights, we must say—my investigations lead me to believe conclusively—that

borax, boric acid, and the other preparations of boron are, as food preservatives, no more dangerous than common salt and saltpeter, and are to be preferred, for various reasons, to these substances.

I am not often consulted in my capacity as a physician and a graduate in medicine, but occasionally I see patients with renal disorders. I have made something of a special study of these maladies and have not infrequently prescribed for them boric acid in considerable doses. I have in some cases administered 10 grains of boric acid four times a day for weeks and months, and I never yet have seen a single case in which there was the slightest unwholesome effect, but, on the contrary, the very happiest results have often followed such administration, so that my personal experience agrees with what I have learned by consultation with others in regard to its effects.

The CHAIRMAN. Are you the author of any book on poisons or anti-septics?

Answer. I am now preparing a book on the subject of poisons, which is about going to press.

The CHAIRMAN. That book has not yet been published?

Answer. It has not yet been issued, but will be in the autumn.

The CHAIRMAN. How extensive have you made this a study?

Answer. I have given a very considerable time for twenty-five years to the study of poison. I have examined a large number of cases of poisoning of all kinds, and have analyzed a large number of foods for the detection of poison. Of necessity I have kept myself acquainted with the literature of all kinds of poisons.

The CHAIRMAN. Approximately, how many different poisoning cases do you think you have been employed to examine?

Answer. Probably 150 different cases.

The CHAIRMAN. All over the United States?

Answer. Yes, sir; in different parts of the United States.

STATEMENT OF ARTHUR R. EDWARDS.

ARTHUR R. EDWARDS, being first duly sworn, testified as follows:

Examination by the CHAIRMAN:

The CHAIRMAN. Will you state your name, profession, and residence?

Answer. My name is Arthur R. Edwards.

The CHAIRMAN. Your profession?

Answer. Physician.

The CHAIRMAN. Residence?

Answer. In this city.

The CHAIRMAN. How long have you been practicing medicine, Doctor?

Answer. Since 1891—eight years.

The CHAIRMAN. Where did you graduate?

Answer. At the Northwestern University Medical School (the Chicago Medical College).

The CHAIRMAN. What, if any, position do you hold now?

Answer. At present I hold the chair of medicine in the Chicago Medical College, Northwestern University Medical School. I am physician to a number of hospitals, including St. Luke's and the Cook County hospital.

The CHAIRMAN. You have made the question of poisons and anti-septics something of a study?

Answer. Yes; I was professor of that subject for a number of years before I had the chair of medicine in the Chicago Medical College.

The CHAIRMAN. I wish you would give us, in a general way, the benefit of your opinion as to the use of preservatives in any articles of food.

Answer. Like Dr. Haines, I think that the ideal method is for the consumer to have the food fresh and without admixture of any preservatives whatsoever; but that is impracticable, because in the transportation of food articles of almost any kind are apt to decompose—milk and butter and cheese and meats particularly—and it might be better, perhaps, to preserve these articles with any one of a number of preservatives rather than to allow the going on in them of decomposition through the action of bacteria, which will surely gain access to these articles of food. So that while it is not the ideal method, still it is a practical method to admix with the food certain articles for its preservation; and, as Dr. Haines pointed out, it is not always practicable to refrigerate, under the circumstances. It would be by far the lesser evil, indeed the very best thing, to add to the foods some mild preservative, which would not in any way injure the human organism. It is the method to which we are compelled to resort, and then it simply becomes a question of the selection of one of a class of remedies. Various preservatives are used—salt, saltpeter, borax or boracic acid, salicylic acid, and still others are used. Other combinations are used, the exact nature of which we are not acquainted with, many secret formulas being used for this purpose.

Regarding these individual preservatives, salicylic acid is, I think, not to be used—that is, if we can possibly avoid it—because it produces quite a number of dangerous symptoms, or may produce many accidents in its use, even when we use it clinically and are aware of its dangers. There are certain individuals who may suffer from serious accidents from the use of salicylic acid or any of its derivatives. It even produces mental symptoms, as delirium or convulsions in susceptible infants. It depresses the heart. It often congests the lungs. It is very apt to disturb the digestion. And then, again (which is possibly its greatest danger), it is particularly apt to irritate or actually inflame the kidneys. So that, as a broad statement, it is a preservative which should be very closely watched and which should not be used indiscriminately at least. I think the consensus of opinion is against its free use. There are other preservatives—formaldehyde and its various derivatives. We don't know much about that as yet, and still they have such a marked local action—for example, upon the upper air passages, when inhaled, when it comes in contact with the fingers, where it hardens and thickens the skin—that we would rather shun it as a preservative, although all of the evidence is not in on that subject.

The most common preservatives are the borax preparations—boracic acid or boric acid—borax, common salt, and saltpeter. We find all of these used. Saltpeter is often injurious, especially injurious because it is known to produce death, because the salts will depress the heart. Potassium salts are particularly depressant. So that I think of these three preparations, or three groups, the saltpeter derivatives are the least to be used. Salt is most commonly used, and possibly most generally considered of all the preservatives relatively innocuous; and still, as a matter of fact, even ordinary salt, as Professor Haines pointed out, produces probably as many deaths as any

of the milder antiseptics. Furthermore, when it is used it enters into such intimate connection with the meat, or the substance preserved, that it often makes it difficult of digestion. For instance, it will harden the meat, so that certain classes of individuals, such as dyspeptics, could not use it readily. Then, again, it may irritate the stomach, to say nothing of the constitutional symptoms which may be produced.

Now, as to the use of borax or boracic acid, the question has been looked into from several standpoints. In the first place, it has been examined, especially lately, with particular care, in order to see what its action upon the digestion is—that is, whether it injures the stomach or intestines or whether it limits the flow of digestive juices; whether it delays the rapidity of the processes of digestion; and these chemical, or these physiological, researches have shown that it interferes very little with digestion in its various forms. The salivary digestion is at the most, even with the use of large quantities of borax or boracic acid, only slowed in its rate, but not impaired as to the intensity of the action of the ferments which are found in the saliva. Experiments show that something like 10 per cent of borax or boracic acid may be used without very greatly interfering with the salivary digestion from the fluids secreted by the glands of the mouth, and that is far in excess of its use in the preservation of any article of food.

As far as its use in the stomach is concerned it does not, even in large doses, interfere with the digestion of the stomach; and it is claimed that when the drug is given to animals or given to human beings in any doses which are reasonably used that it rather aids than retards digestion.

And then with the digestion in the bowels, the digestion which is carried on by the bowels, and especially by the juices of the pancreas, it appears rather to aid the digestion there, if any change whatever is made in the digestion. So that, merely considered as a drug, as we would administer it to an individual from this experimental standpoint, it is devoid of any danger.

Now, looking at it from the other standpoint, more from the standpoint of a practitioner or of a physician, borax and boracic acid have been used in very large quantities, used very persistently, used in all kinds of doses, in various conditions of debility, without producing any very essential effect on the organism. That is, it may be given to children who are probably more susceptible, even, to proportionate doses of poison than any other class. Relatively large doses can be given to children, and, indeed, in the treatment both of medical and surgical diseases of childhood the drug and its various compounds has been used without any essential danger. Children being very susceptible, it is nevertheless used as a mouth wash, often in the new-born, often where there are little mold growths in the mouth, the child being allowed to swallow considerable quantities of it without any injurious effect.

In adults very large doses can be given. In the old days, when epilepsy was treated by borax, very large doses were given, and very seldom, indeed, with any especial effect on the organs, from 60 to 100 grains not being infrequently administered.

At the present time we can use borax or boracic acid either internally or externally. As far as its external use is concerned, we would not hesitate to apply it to the skin in almost any condition. Simply as an example: In a child with burns, where the skin must be kept moist, or where we wish germs to be excluded from the skin in order

to avoid blood poisoning, we may wet the dressings with a saturated boric acid solution and lay them on the skin with very little, if any, danger of bad effects from its absorption, while practically every other antiseptic is interdicted because of the danger of absorption of the poison. Infants with a limb injury can be immersed bodily or have the part continuously irrigated, continuously soaked in a solution of boric acid, without practically a thought even of danger to the individual. We don't regard the danger as practically anything. In the same way, when we use it internally we don't dread any action from its use.

When we wish to use an antiseptic in any of the cavities of the body, even in the most delicate individuals, or where we wish to use antiseptics in people who are prone to react very delicately to other drugs, we use boric acid without any fear whatever. For instance, we can use it to wash out the stomach. We would not hesitate to wash out the stomach with it, and we would not hesitate, and, indeed, practically we always do, leave certain quantities of the acid in the stomach. The borax, like the sodium bicarbonate and other remedies, dissolves the mucus, and then is an antiseptic besides. So that we would wash out the stomach a number of times, introduce a considerable quantity of boric acid, and allow a considerable quantity of it to be drawn off by the stomach tube, and we would not apprehend any serious results if the whole amount were left in the stomach.

I have personally used it most frequently in this direction, to wash out the bowels, especially when the bowel is the seat of various mucous inflammations, where there is what is known as a mucous inflammation of the colon. It is a favorite remedy for use there. We use it without any fear of poisoning at all. If it remains in the bowel and does not escape that does not concern us. We wash out the bladder and wash out other cavities with it. In surgical proceedings we would wash out the bowels freely with it, where we would use probably no other antiseptics for fear of the local irritation, or for fear that considerable quantities would be dissolved. We wash out the chest cavity. Often it is used in operations on the brain or bowels, where we would hesitate to use the strong corrosives like corrosive sublimate and carbolic acid. In this connection it might be said that boric acid and borax, and boric acid particularly, is not an acid in the ordinary sense. It is not a corrosive. It does not change the tissues with which it comes in contact; that is, as we popularly understand the term "acid," it is not really an acid, any more than carbonic acid is an acid. It does not effect local changes in the tissues. So much more from my own personal standpoint and what I have seen of its use, and when we come to transfer its use to preservatives it is not a remedy which will prevent tissues or foods which are already decomposing from actual decomposition after its use. In other words, it does not pickle or fix or harden meat as a brine solution would or as bichloride or formaldehyde or any of its preparations would. It does not injure the food if it is used. We would not hesitate to give it even to children for digestive disturbances. It is often given in milk.

While ideally we desire to avoid preservatives, still when it comes to a practical view point boric acid and its derivatives have practically no dangers at all; and in looking over the same literature which Dr. Haines mentioned, we find even in the most recent works a denial by high authorities on the subject that any ease of death has been due to boric acid; and in cases which were recorded by other

writers we have the possibilities which can be excluded, in which it suggests itself at once to us that the person who died while using boric acid or while taking enormous doses of the drug, probably died from the disease for which the drug was used. That is, a patient having decomposition going on in the bladder, or having severe kidney trouble, would be more likely to die from the trouble for which the remedy was administered than from the very small doses of the remedy itself. That is a point which is not enough regarded in the few cases of poisoning which have been mentioned.

You may say practically, with the more critical authors, that very few, if any, authenticated deaths have resulted even from the most enormous doses. So that, considering the small percentage of borax or boric acid which is used in food as shown by our use of it in surgical and medical practice and as applied to the digestive tract, it is absurd, as shown by physiological experiments on digestion, as shown by even these alleged fatal cases, to say that it is a preservative which we need in any way dread. It is the ideal preservative, superior even to common salt, because of the lack of change or admixture of the substances to which it is added for preservation.

The CHAIRMAN. Do you agree with Professor Haines—and I think Professor James as well—that the article preserved does not absorb as much borax as it does salt, for instance?

Answer. It absorbs very little; yes. The articles, as I understand, are simply rolled in this preservative. It is packed around and outside, and it operates differently from what it would—for example, from what salicylic acid would in beer. There it is mixed in solution and permeates the entire substance, and here it is applied as an external application, unless there is something to pickle or soak the product—something kept around it—in order to prevent the germs in the air from reaching the substance to be preserved. It is rather a shield against decomposition than an actual antiseptic which would soak the tissues. It enters very little into the substance of the meat. In butter and milk, of course, it would be mixed very intimately, but even then without danger.

The CHAIRMAN. The question has been asked whether fresh pork is better from a health standpoint than properly cured pork.

Answer. As far as pork is concerned, no; there is always danger from pork. Hog cholera and the various poisons in that, and trichina, etc.—it is much better to have it either cooked or cured.

The CHAIRMAN. So that that would be one exception to the general rule, which you say is the ideal method.

Answer. Of course, the ideal deals with perfectly fresh food, and food that is perfectly free from disease, which, however, under existing conditions, is almost impossible to procure. (Addressing Professor Haines): Would that meet your approbation, Professor Haines?

Professor HAINES. Yes, entirely. I should have made that reservation in my remarks.

The CHAIRMAN. That an article of fresh pork—some of the dangers as a food article are removed by proper curing?

Professor HAINES. Unquestionably.

Dr. EDWARDS. That is very true.

The CHAIRMAN. Do you think of anything further, Doctor?

The WITNESS. I don't think so.

The CHAIRMAN. Your personal experience bears out the investigation of others, that you have given in your testimony?

Answer. I should say there that the bulk of these statements I

made are not only the result of what I know from literature—that is, the theory of the subject—but also from especially the practical standpoint of my own individual experience—that is, that it is used internally and is used in washing out cavities and in washing out the bowels, etc. I would like to make it read that way.

The CHAIRMAN. And you are engaged in active practice in internal medicine?

Answer. In internal medicine; yes, sir.

TUESDAY, June 7, 1899.

The committee met at 10 o'clock a. m.

Present, the chairman.

STATEMENT OF MR. KARL EITEL.

Mr. KARL EITEL, first duly sworn, testified as follows:

The CHAIRMAN. What is your name?

Mr. EITEL. Karl Eitel.

The CHAIRMAN. Where do you reside?

Mr. EITEL. Six hundred and sixty-four Evanston avenue.

The CHAIRMAN. City?

Mr. EITEL. Yes, sir.

The CHAIRMAN. What is your business?

Mr. EITEL. I am an importer of wine and beer.

The CHAIRMAN. What firm are you connected with?

Mr. EITEL. The firm of Eitel Bros.

The CHAIRMAN. From what country do you import beer?

Mr. EITEL. From Bavaria, and from Bohemia—states of Austria.

The CHAIRMAN. Do both the countries of Germany and Austria have laws regarding the regulation and manufacture of beer?

Mr. EITEL. Germany has it. The single states of Germany and I think of Bohemia; I am not positive.

The CHAIRMAN. How about Bavaria?

Mr. EITEL. They are the strictest that we have had so far.

The CHAIRMAN. Do you remember, just briefly, what the terms are in regard to the manufacture of beer in Bavaria?

Mr. EITEL. That is quite a very long letter, and I would not like to undertake to say, but I will give you a copy of it. It takes a little time to secure it as I have to get it from the German consul.

The CHAIRMAN. Does it require the use of a certain amount of hops and malt?

Mr. EITEL. I could not tell you exactly. I would rather prefer to give you a copy of the law.

The CHAIRMAN. One of the complaints made by scientific men against beer of all kinds and wines is the use of antiseptics for preserving. Is there any preservative in the beer that you import?

Mr. EITEL. I know positively that in the beer that we buy from Munich that there is nothing in it but malt and hops. Nothing but alcohol; no chemicals.

The CHAIRMAN. Any salicylic acid?

Mr. EITEL. The Bavarian Government would not allow that. I know that some parties made up once a proposition to put our beers in free port, either at Rotterdam or Antwerp, or to adulterate with salicylic

acid, but as it was with beer you can not reach a case again when it was filled up. They wanted to try that once, but I claim that any beer that will be exported direct from Germany has direct consular investigation from Munich. It could not be touched. It leaves the country in bond to the United States. There is in Germany, between the States—there is a tax collected on beer so that they can know the character and the class of it. It is placed there in bond the same as it is here. If the beer should be adulterated it would have to be adulterated in Munich. I do not believe that any responsible firm would adulterate any such thing, the same as any American brewer would not undertake to sell his beer without a stamp, which is an utter impossibility.

The CHAIRMAN. What countries do you import wine from?

Mr. EITEL. From Spain, from France, and from Germany.

The CHAIRMAN. How about the use of antiseptics in wine? Do you know anything about that?

Mr. EITEL. Of course all different countries have different systems, but it is largely a matter of convenience with the firms you buy from. The law for the wine-producing States in Germany is very strict, and it is limited to a certain per cent that will be allowed to be used, of sugar and all that. I could also furnish you a copy of that—a full copy of the law, so that you could see how the Government looks out for that. I do not know the details. They allow you to make what we call artificial wine. It has to be sold under that name and labeled as artificial wine, and as artificial beer or beers.

The CHAIRMAN. They have a system which compels the marking of goods for just what they are.

Mr. EITEL. Yes; they have one system of making wine and they press the grape and put some chemicals and sugar and other things to it and make what they call a second wine. That is full of adulteration. It has to be sold by the name.

The CHAIRMAN. That would be a good way to reach it in this country. I think that is all. I may want to ask you some other questions. I am much obliged to get this. The plan of the committee is to get them to mark their beer and wine for what it is.

Mr. EITEL. Yes; to simply sell it under the full name. You can go in any of the small wholesale houses and ask for Rüdesheimer and Johannisberger and all that and they will give you something, but you do not know what kind of wine; they sell it under a false name.

The CHAIRMAN. They commit a fraud. It may be healthy and all right?

Mr. EITEL. Oh, yes; but it is adulterated.

The CHAIRMAN. Is it possible for the retailer to put in that adulteration after he gets it in his hands?

Mr. EITEL. In bottle goods that is not possible. In casks he could do it.

The CHAIRMAN. Retailers sometimes are bottlers.

Mr. EITEL. Yes, sir; there is no way of controlling that.

STATEMENT OF MR. C. V. PETRAENS.

Mr. C. V. PETRAENS, being first duly sworn, testified as follows:

The CHAIRMAN. What is your name?

Mr. PETRAENS. C. V. Petraens.

The CHAIRMAN. What is your business?

Mr. PETRAENS. I am a chemist. I am a graduate of the University of Copenhagen. I have been practicing for about—since 1871, and at present am running a lead-smelting and white-lead plant at Joplin, Mo.

The CHAIRMAN. Now in order to save time and to be consistent in this matter, I will direct your attention to the question of alum baking powder. Mr. Rew has wanted your evidence in this record and the committee are very glad to get it, and if you will state your knowledge, and experience, and opinion, the committee will be very much obliged.

Mr. PETRAENS. I never personally manufactured any baking powder, but some ten or fifteen years ago I was consulted by manufacturers about baking powder, and more from a scientific interest than for any other reason I investigated the matter of alum baking powder, and wrote an article for the paper on the subject, and I came to the conclusion that alum baking powders were really the most perfect of any in the market; that is, that desiccated or burnt alum was the most perfect acid ingredient used in baking powder, for the reason that in connection with bicarbonate of soda it forms less residual inorganic matter than any other class of substances. It is slow in its action and is far more perfect than either cream of tartar itself or any phosphate in rasing bread or dough. The residual matters from alum are perfectly harmless and far smaller in quantity than where cream of tartar is used. There are baking powders of commerce, but they are not pure alum baking powders. They are a mixture of, say, 75 per cent of alum and 25 per cent of phosphate baking powder. Of course there is nothing to say against the residual matters. They are substances that are not unwholesome, but want that excess in boiled flour. The alum part of the baking powder, or 75 per cent of the baking powder, will produce about 22 per cent of sodium sulphate, and about $3\frac{1}{2}$ per cent of alumina oxid.

Cream of tartar baking powder produces 70 per cent of sodium potassium tartrate, which is the basis of Rochelle salts. The two salts, sodium sulphate and Rochelle salts, have about the same action on the human system, and one is as harmful or as harmless as the other. The alumina, or alumina oxide, is perfectly harmless. It is insoluble in the gastric juice of the stomach and passes out of the system with the solid excrements. They do not enter the circulation or they would show in the urine, which it never does. The action of burnt alum in baking powder is very slow, for the reason that burnt alum is insoluble in cold water. During the kneading of the dough it is gradually absorbed by the water and acts on this bicarbonate of soda, leaving very fine pores in the dough. It enables the baker to do his work—his kneading work—slowly and thoroughly, and makes a more wholesome food than when he has to hurry it up so as to get his dough in the oven as quick as possible. On the other hand, there is no danger whatever of any alum being left in the dough at the baking, as the heat of the oven hastens the reaction of water on the burnt alum very much, and any undecomposed alum will rapidly decompose or be decomposed by the soda in the oven. The question of alum in baking has come up from the fact that bakers have often used a very inferior flour, and alum enables them to use such flour and make a fine appearing bread. The quantity of alum they use is hardly sufficient to do any harm at all—I might say is absolutely insufficient to do any harm. The harm consists in using a wormy or poor flour and passing it out upon the public as a first-class bread.

The CHAIRMAN. In brief, then, you consider alum baking powder as not deleterious to public health?

Mr. PETRAENS. I consider it not deleterious to public health.

THE CHAIRMAN. You base that upon analyses you made yourself?

Mr. PETRAENS. I base that upon the knowledge I found myself and upon experiments.

STATEMENT OF THEODORE OEHNE.

Mr. THEODORE OEHNE, first duly sworn, testified as follows:

The CHAIRMAN. What is your name?

Mr. OEHNE. Theodore Oehne.

THE CHAIRMAN. Where do you reside?

Mr. OEHNE. 5401 Ellis avenue.

THE CHAIRMAN. What is your business?

MR. OEHNE. I am vice-president and treasurer of the Conrad Seipp Brewing Company.

The CHAIRMAN. Do you hold any official position in an organization that is interested in this country? There are national and State associations.

Mr. OEHNE. I hold office in a local organization. I am president of the Chicago and Milwaukee Brewing Association.

The CHAIRMAN. This committee desires to take the evidence of any citizens and all citizens who can give information relating to the food and drink products of the country that are sold either in fraud of the rights of the consumer or that contain substances which are deleterious to the public health, and I desire to ask first your opinion as to the propriety of national law on this subject. Taking the subject of beer to start with, whether you would favor a Government inspection and some Government regulation of the food product known as beer?

Mr. OEHNE. We certainly are not adverse to a Government inspection. If my memory serves me right, the Retail Bottlers' Association has petitioned Congress to look into this question, because so much has been said about adulterated beer. We want this Government commission to settle this question fully and for all times.

The CHAIRMAN. The honest manufacturer of goods wants no favors, but he wants his competitors to be compelled to deal fairly with the people.

Mr. OEHNE. That's right.

The CHAIRMAN. Are you familiar, Mr. Oehne, with the law in Germany or Bavaria as to the regulation of the products that might go into beer? Have you any general information?

Mr. OEHNE. I have got a slight general information. I am not familiar with the laws, however.

The CHAIRMAN. Do they require in this country that a certain amount of hops or malt should be used? Do they determine when malt should be used?

Mr. OEHNE. I am not able to answer that question. I am not familiar enough with the question to do that.

The CHAIRMAN. There has been a great deal said in regard to the use of antiseptics in beer. An antiseptic is a product that is put in to preserve the beer the same as salt is put in to preserve the meat or borax to preserve meat, and I have no evidence before this committee that that is used. There has been some witnesses that have stated it upon hearsay. I think that Dr. Wiley stated in his examination of beer made some years ago, if my memory serves me right, that he found salicylic acid in bottled beer he analyzed in Washington. Any

information you have on that subject you are willing to give to the committee you may give for its benefit.

Mr. OEHNE. In reference to the use of antiseptics in beer I have not any knowledge that there is any used at present. There may have been some used years ago, and only then in bottled beer; but some years ago, if my memory serves me right, I should say about seven, eight, nine, or ten years ago, we commenced what we call pasteurization. This is a process invented by Pasteur in France. After beer is bottled in quarts it is put in a steam tub and heated to a temperature of about 140 or 150° F., which it is claimed will kill and destroy all yeast germs or any other germs in the beer, and thoroughly prevent what we used to call after-fermentation, which makes the beer cloudy and produces a sediment. Ever since this process has been adopted I do not think that there are any antiseptics used. There may be; of course I can't talk for any and all brewers in the United States. I do not think that a great per cent of the brewers use it.

The CHAIRMAN. You can see no reason for it?

Mr. OEHNE. Absolutely no reason.

The CHAIRMAN. This process is the same as what is called "sterilization?"

Mr. OEHNE. It is the same process as sterilization.

The CHAIRMAN. So called on account of the name of the man who invented it?

Mr. OEHNE. Yes, sir. I have got here, Senator, something from the "American Brewers for 1897," which touches upon this very question [hands the Chairman copy of paper]. It is a lengthy article.

The CHAIRMAN. It appears to be an editorial in one of the Brewers' Reviews.

Mr. OEHNE. Yes, sir.

The CHAIRMAN (reading from paper). "The national pure-beer law adapted to American conditions would not be cause for fear to anybody."

Mr. OEHNE. Yes, sir.

The CHAIRMAN. That is, no fear to any honest manufacturer?

Mr. OEHNE. No, sir.

The CHAIRMAN. In your opinion, then, the sterilization of beer—boiling it up to a certain degree after it is bottled—removes any necessity for the use of any antiseptics.

Mr. OEHNE. Absolutely so.

The CHAIRMAN. Because it will destroy all germ life that is left over?

Mr. OEHNE. That has been practiced. The germs are destroyed by a heat of 120 degrees, and now we heat up to 140 or 150 degrees to be absolutely sure that nothing will remain in it.

The CHAIRMAN. One of the experts who testified—one of the medical experts who testified, speaking of the question of a national pure-food law or a national board (I think it was Dr. Wiley)—testified that most brewers, so far as he had observed, made hop and malt beer; that they also used in place of hops and malt other substances—for instance, like glucose, which he said was not deleterious to health, so far as he was questioned concerning the making of a poorer beer than hop and malt.

Mr. OEHNE. We are using corn and rice—raw materials—and this question has been before a committee of the United States Congress, and it has been recommended by the United States Congress that the use of corn is not only not detrimental, but beneficial. I have also

got a pamphlet on that question, where an analysis by Dr. Wiley is given as to the corn question, which I will submit to you, Senator [hands Chairman paper].

The CHAIRMAN. Yes; Dr. Wiley referred to that. He stated that he did not know that he could get the document.

Mr. OEHNE. This is issued under the authority of the Secretary of Agriculture—Indian corn or maize in the manufacture of beer.

The CHAIRMAN (reading from paper). "By Robert Wahl. Published by authority of the Department of Agriculture." This is not a Congressional report.

Mr. OEHNE. No; it is not.

The CHAIRMAN. It is an article by Professor Wahl.

Mr. OEHNE. He is a man eminent in his profession, because the Agricultural Department issued it as an agricultural document.

The CHAIRMAN. Has the consumer of this product, which a good many people like, any way of knowing whether it is malt beer, what we call the old fashioned lager beer, or whether it consists of corn or rice?

Mr. OEHNE. No; the consumer could not know that except by analytical investigation.

The CHAIRMAN. There is no mark on the package?

Mr. OEHNE. No.

The CHAIRMAN. And all brewers make different kinds of beer to suit the different taste.

Mr. OEHNE. Yes, sir; there is a different demand. Some like it dark and some light. Our business has taught us in the last ten or twelve years that a pure malt beer is almost unsalable in this country; it is too strong and heavy; the people want a lighter beer and this light beer could not be produced by using pure malt. Pure malt beer is a strong, heavy beer.

The CHAIRMAN. So each brewer has to make different kinds and grades of beer.

Mr. OEHNE. Some brewers do, others do not.

The CHAIRMAN. Would it be your idea that if we could have a Government commission so that there would be some regulation as to the manufacture of the beer itself—you would not think it wise to have the Government expert tell the manufacturers what kind of beer to make, whether it should be corn, or malt, or hops; you would not expect that?

Mr. OEHNE. If we could have a commission which will recommend the American way of making beer, and which has been highly commented on in 1893 by European experts at the World's Fair, there would be no objection. It would certainly be very unwise for any government commission to go to work to-day after the manufacture of beer has progressed, to come and say you can't use anything but hops and malt, because we would have to produce a beer which would be unsalable almost. We claim the use of rice and corn is beneficial. It is certainly not detrimental. It is the other way. It makes a beer which is more palatable and which is healthy. There is not anything but God's product in it. No chemicals, and under our process of manufacture there is no reason to-day why rice and hops and corn and glucose should not be used.

The CHAIRMAN. Glucose is corn?

Mr. OEHNE. It is a corn product.

The CHAIRMAN. And you have got to get glucose out of the corn before you make beer?

Mr. OEHNE. Yes, sir.

The CHAIRMAN. I don't want to ask you about other people's business. You have been very fair about your own process. Why is it, if you can tell me, there is a certain class of cheap beer on the market, and it has an important use, which is made by a cheaper or shorter process, or by cheaper material. Certainly all the beers that are made in this country are not of the same grade and the same price?

Mr. OEHNE. No.

The CHAIRMAN. Some well-known beers are very cheap. They are not always favorably known. There is a cheap way of making beer.

Mr. OEHNE. There is no cheaper way of making beer. But there is a way of making cheaper material. You can buy cheap barley and high-priced barley, and you can buy cheap hops and high-priced hops. That will make a difference; otherwise the process is the same thing. You might take a little more material or a little less material.

The CHAIRMAN. Now, there is no law either State or national to fix the strength of hops or the kind of malt to be used in beer. There is none now to my knowledge. Is it your recollection that that is fixed by European laws?

Mr. OEHNE. I think so. I think there used to be a law here twenty or twenty-five years ago. Brewers were compelled to take a certain amount of malt and barley in making beer. I noticed in the paper this morning that Dr. Stringfield stated yesterday that from his knowledge of beer it was adulterated with salicylic acid. I want to say a few words—

The CHAIRMAN. I want you to be correctly informed as to his statement.

Mr. OEHNE. Yes, sir.

The CHAIRMAN. Because he stated that he had not made any analysis.

Mr. OEHNE. His belief was that a majority of the beer was—

The CHAIRMAN. It was generally stated so. He did not give any definite information on the subject except some time ago he had a patient who seemed to be affected in that way. I want you to be perfectly informed what he said. I will be very glad to have your statement.

Mr. OEHNE. Now, in reference to the use of salicylic acid. In former years there may have been some used; there may be some used yet by a few brewers but this is certainly only used in preserving bottled beer. There is not 5 per cent of the beer brewed in the United States which is bottled. It is sold in barrels. There is no acid in barreled beer; there is no occasion for it. There may be some in bottled beer, but just as I stated I do not think that there is more than 5 per cent of the beer brewed in the United States that is bottled. So if the statement is made that a large proportion of all the beer brewed in the United States contains salicylic acid it is erroneous. That is only used for bottled beer, and hence does not contain but little. I do not think that 10 per cent of the beer to-day contains any salicylic acid. Of my own knowledge I do not know.

The CHAIRMAN. Well, you do not see any benefit to be obtained by using it, you say, after this sterilizing process?

Mr. OEHNE. No, sir.

The CHAIRMAN. Well, all of the beer—you believe this cheap beer made of cheap hops—and you know, of course, that there might be one pound of hops on this side of the table and another pound on the other side over there, and one would produce twice or three times as

much flavoring value as the other would. Is it true that cheaper beer made of hops, cheap or unripe or unperfect hops and barley say—is it not true that that class of beer may need the use of some preservative?

Mr. OEHNE. No.

The CHAIRMAN. You think that the sterilizing process would perfect that beer for the market?

Mr. OEHNE. Yes, it would. The only difference would be in the percentage of alcohol in the beer. The better material you take, the stronger beer you can produce. The beer contains more alcohol.

The CHAIRMAN. The alcohol is really the preservative of beer, after all.

Mr. OEHNE. Yes, sir.

The CHAIRMAN. It runs from four to five or six per cent, as a rule. It simply—

Mr. OEHNE. Four or five or six. Sometimes a little less.

The CHAIRMAN. It requires a small per cent of alcohol, even after the sterilizing process. It would not be safe—you can't make beer without some alcohol?

Mr. OEHNE. The fact of fermentation is the fact that produces the alcohol.

The CHAIRMAN. Then so far as you know, and so far as your opinion goes, there is no salicylic acid used in beer except in bottled beer?

Mr. OEHNE. Not to my personal knowledge.

The CHAIRMAN. While there may be a very small per cent, you can see no reason why it should be used at all?

Mr. OEHNE. No.

The CHAIRMAN. Have you any other article from men well known in the scientific world as to the danger or the safety of the use of other ingredients besides barley, malt, and hops in beer? In your opinion, you say that the other is just as good and just as healthy—glucose the same.

Mr. OEHNE. Yes, sir.

The CHAIRMAN. Have you any scientific opinion, or do you know of anything that you could furnish the Committee with to the effect that it would be just as good for the public health as pure malt beer?

Mr. OEHNE. I think I could; yes. Not this minute, but in a week or so I think I could get it.

The CHAIRMAN. I think that is all. I am very much obliged.

STATEMENT OF ERNEST FECKER, JR.

Mr. ERNEST FECKER, Jr., first duly sworn, testified as follows:

The CHAIRMAN. What is your name?

Mr. FECKER. Ernest Fecker, jr.

The CHAIRMAN. Where do you live?

Mr. FECKER. Twenty-three Lincoln place.

The CHAIRMAN. What is your business?

Mr. FECKER. Manager of the United States Brewing Company.

The CHAIRMAN. Where is that located?

Mr. FECKER. We have different breweries; the main branch is at 67 Larabee street, Chicago.

The CHAIRMAN. Are you a practical brewer?

Mr. FECKER. Yes, sir.

The CHAIRMAN. You understand the business in all its branches?

Mr. FECKER. Yes, sir.

The CHAIRMAN. What do you say, Mr. Fecker, as to the propriety of having some national legislation in regard to the protection of manufacturers?

Mr. FECKER. I have been one of those favoring a petition. I have been one of the originators of that petition, and I am consequently in favor of it.

The CHAIRMAN. Do you remember when you made that petition?

Mr. FECKER. It was about the last of December, I think.

The CHAIRMAN. You feel that some general law would be beneficial?

Mr. FECKER. It would be a benefit to our business to prevent the prejudice that seems to exist among a majority of the people as to our business.

The CHAIRMAN. Where was that petition presented?

Mr. FECKER. I think it was drawn up in New York in December.

The CHAIRMAN. And presented to Congress last session?

Mr. FECKER. Yes, sir.

The CHAIRMAN. That was the impression I had, that you people wanted a pure-beer bill, like, as this editorial says, on the American plan. In the use of alcohol in the manufacture of beer do you use any salicylic acid?

Mr. FECKER. No, sir.

The CHAIRMAN. Do you use any preservative?

Mr. FECKER. We do not use any, and we have not used any for years, as there is no occasion to use it. Years ago it might have been used, but with the machinery we have to-day it becomes unnecessary if the beer is not subjected to the change of temperature. It might have been used before we had ice machines, but with their use we now keep an even temperature. There is a less degree of fermentation, which is only produced by the yeast.

The CHAIRMAN. The yeast is the flavoring power?

Mr. FECKER. We put in materials to keep it with.

The CHAIRMAN. What process do you use?

Mr. FECKER. As Mr. Oehne testified, Pasteurization is the way to preserve beer. I would heartily indorse everything he has said in that way.

The CHAIRMAN. You do not know of anyone now using salicylic acid in beer?

Mr. FECKER. It would be a waste of money to use it; its cost would simply be a waste of that much money.

The CHAIRMAN. This Pasteurization takes away the necessity?

Mr. FECKER. Yes; before that salicylic acid was used.

The CHAIRMAN. Are you familiar, or have you learned by reading or hearsay, whether or not the European laws—take Bavaria, or any German country—whether or not they have a law which compels a certain amount of hops and malt in, say, a barrel of beer?

Mr. FECKER. If I have the correct knowledge of the law it does not restrict them as to the quantity used. I believe it compels the use of malt and hops, but there is no restriction as to the quantity.

The CHAIRMAN. Does it prohibit the use of corn and rice?

Mr. FECKER. It does prohibit the use of corn, I believe, in Austria. They tax it by the strength of the beer—by the quantity of malt and the strength. There is no law there regulating the amount to be used.

The CHAIRMAN. When the tax is paid the retailer knows the strength of what he is buying, because it has to pass through a Government test.

Mr. FECKER. After it is bottled, in Austria, they tax it then. Before they ever know whether it becomes a finished product or not. It may spoil. If I have the correct information, that is it. They tax it by what they call the saccharometer test, whereby they test its strength.

The CHAIRMAN. They put a tax on it according to the beer—its degree of strength?

Mr. FECKER. Yes, sir; if I have the correct knowledge of the law.

The CHAIRMAN. That is only just your recollection?

Mr. FECKER. Yes, sir.

The CHAIRMAN. For my information I am going to get those laws and have them translated and see. The American people do not drink that kind of beer, do they; they do not care for the strength of the pure hop beer?

Mr. FECKER. I would define the strength of corn beer and malt beer in a different way. The corn beer has a vinous character, and for that reason it is more palatable. It is lighter to the tongue and more pleasing than the malt beer. The degree of fermentation is not as high as that of malt beer, and that is why the public to-day in choosing between the two beers will choose the corn beer every time. While its strength is not any heavier, malt beer is not any heavier beer than corn beer, providing the same man would make it, but the degree of fermentation is higher in one case than in the other and consequently the character of the taste is different.

The CHAIRMAN. Do you see any reason why in buying a cheaper grade of beer made of a cheaper hop or a cheaper malt, there would be any use for a preservative?

Mr. FECKER. No, sir; because the process of protection would be the same, the manufacture would be the same, and there is no reason, as I can see, why, if a careful man would handle it, there should be any use for a preservative any more in the one case than in the other.

The CHAIRMAN. Do you know any reason why there should be any difference in the actual value of beer—the actual difference? I am not talking about the difference that might be brought about by advertising. Do you know of any reason why there should be any difference in the value, except in the raw material, the labor being the same?

Mr. FECKER. I do not see any.

The CHAIRMAN. In your opinion a beer that is really made cheap is made cheap because of the cheaper material?

Mr. FECKER. A cheaper material?

The CHAIRMAN. Have you produced a beer with malt, containing a small amount of the extract of hops?

Mr. FECKER. Malt would not contain an extract of hops. If you take hops and take the same pound of hops—one pound would contain a certain per cent of hop extract and another pound would contain say 50 per cent. You could take a cheaper hop or a weaker hop and make the same amount of beer. You would not get the same barrel of beer because you might have a good pound of hops and there would be a difference in the hop flavor. The cheaper might answer.

The CHAIRMAN. It would produce fermentation?

Mr. FECKER. It would produce the hops you were looking for and would be giving a flavor.

The CHAIRMAN. Wouldn't you have to use twice as many hops?

Mr. FECKER. No; the finished product would not have as good a flavor, while the good hop would leave a nice flavor.

The CHAIRMAN. That is all.

STATEMENT OF C. HERMAN PLAUTZ.

Mr. C. HERMAN PLAUTZ, first duly sworn, testified as follows:

The CHAIRMAN. What is your name?

Mr. PLAUTZ. C. Herman Plautz.

The CHAIRMAN. Where is your residence?

Mr. PLAUTZ. I live at 731 North Hoyne avenue.

The CHAIRMAN. What is your occupation?

Mr. PLAUTZ. I am secretary of the United Brewing Company.

The CHAIRMAN. Secretary of the United Brewing Company?

Mr. PLAUTZ. Yes, sir.

The CHAIRMAN. You have been a resident of Chicago a great many years and held public office here?

Mr. PLAUTZ. Yes, sir; since 1867.

The CHAIRMAN. What public office have you held?

Mr. PLAUTZ. I have held the office of city clerk and city treasurer.

The CHAIRMAN. Are you a practical brewer? Do you know anything about the brewing business generally?

Mr. PLAUTZ. I am a practical brewer; I know the business, having been engaged in it for the last ten years.

The CHAIRMAN. Where is your factory in Chicago, or brewery?

Mr. PLAUTZ. We have thirteen plants, and they are located in various parts of the city.

The CHAIRMAN. Well, Mr. Plautz, there has been some talk here about the use of salicylic acid for preserving bottled beer. I think I have had no evidence that there is any salicylic acid used but in bottled beer. What is your opinion on that subject, and what are the facts so far as you know them?

Mr. PLAUTZ. So far as I know there is no need of using any salicylic acid or preservative of any kind in keg or bottled beer.

The CHAIRMAN. Why?

Mr. PLAUTZ. The process of pasteurization is sufficient to preserve the beer for the length of time it is necessary until it is consumed. If we were to export bottled beer, say to some southern climate, it would probably be well then to use a little salicylic acid in it as an additional preservative, but inasmuch as our beer is principally drank in this country I do not think it necessary at all.

The CHAIRMAN. Then you think there may be a condition where a change of climate and shipment and constant agitation for a length of time would require some preservative?

Mr. PLAUTZ. Yes, sir; I think that all beers that are imported into this country from abroad contain a very little salicylic acid. We would have to do the same thing if we were to export beer into a foreign country.

The CHAIRMAN. There was a gentleman who testified yesterday morning who was an importer of beer and he said that they did not use any; that the government there in Bavaria prohibited the use.

Mr. PLAUTZ. The government prohibits the use in their country. It would not prohibit it if it were to be exported.

The CHAIRMAN. It makes a difference who the consumers are?

Mr. PLAUTZ. Yes, sir.

The CHAIRMAN. That is the coffee question?

Mr. PLAUTZ. Yes, sir.

The CHAIRMAN. Mr. Plautz, you and all of these organizations and brewers—you must consume a great deal of the raw material?

Mr. PLAUTZ. We do.

The CHAIRMAN. Malt and hops and corn and rice, these are the articles that you use?

Mr. PLAUTZ. Yes, sir.

The CHAIRMAN. Did you hear what the gentleman said who was just on the stand in regard to a national law for the inspection of beer?

Mr. PLAUTZ. Yes; I heard that.

The CHAIRMAN. What would you say as to that; does that meet with your approval?

Mr. PLAUTZ. Yes, it does; I think that it would be a good thing for the brewery interest, because it would remove the prejudice that a great many people have against the use of beer.

The CHAIRMAN. And it would also give—if it was under a Government inspection it would give a certain character to the product itself which you could not get in any other way?

Mr. PLAUTZ. Yes, sir.

The CHAIRMAN. And if there are those who are using cheap and adulterated materials it would reach them, and in that way benefit the honest manufacturer, wouldn't it?

Mr. PLAUTZ. Well, there are no adulterations used in the manufacture of beer. You can use only a lower grade of material, but it would not be adulterated beer; it would be a cheaper grade of beer.

The CHAIRMAN. The same as a cheaper grade of flour where they use the number 2 wheat instead of number 1?

Mr. PLAUTZ. Yes, sir.

The CHAIRMAN. Do you have any recollection of any of the European laws—I will not take but just a minute—as to whether or not they specify that a certain amount of malt or hops must be used?

Mr. PLAUTZ. I believe the Bavarian law requires that.

The CHAIRMAN. And does it not prohibit the use of corn and rice?

Mr. PLAUTZ. In Bavaria—and in other European countries, in fact—there is a great deal of corn goods exported to Europe and used there in the manufacture of beer.

The CHAIRMAN. There is a great deal of our glucose shipped there?

Mr. PLAUTZ. No; the corn product, the same as we call "grits," which is a preparation made out of corn in a granular form, and it is used for the purpose of making beer.

The CHAIRMAN. I think that is all, except I want to be sure I have this question: As far as you believe—and you are secretary of something like thirteen breweries—you know of no ease in any of the breweries where they use preservatives like salicylic acid?

Mr. PLAUTZ. I know of not one.

The CHAIRMAN. The only preservative you use is the natural alcohol in the beer?

Mr. PLAUTZ. To form the process of fermentation.

The CHAIRMAN. And the sterilizing process?

Mr. PLAUTZ. Yes, sir.

JUNE 8, 1899—10 o'clock a. m.

The committee met.
Present, the Chairman.

STATEMENT OF WILLIAM F. FAULKNER.

WILLIAM F. FAULKNER, being duly sworn, in response to questions by the Chairman, testified as follows:

The CHAIRMAN. What is your name and occupation?

Answer. William F. Faulkner; 2929 South Park avenue.

Q. And your business?—A. Superintendent for Kehoe & Co.

Q. What is their business?—A. Confectioners.

Q. What are your duties in connection with that company?—A. Overlooking the manufacture of candy.

Q. You superintend every part of it from the beginning to the end?—A. Yes, sir; the manufacturing part.

Q. You know what goes into the manufacture of the candy in that establishment?—A. Yes, sir.

Q. Do you personally see that the mixture is made?—A. Yes, sir.

Q. Now, Mr. Witness, the committee does not want to get any firm's trade secrets. We don't want to interfere with any legitimate business. The resolution directs us to find out what food is manufactured in fraud of the rights of the people and what, if any, foods are deleterious to health. How long have you been a superintendent in this factory?—A. Ten years.

Q. You have some general information as to the materials used in other factories also?—A. No, sir.

Q. You have heard, I suppose?—A. No; not anything.

Q. Then, if you can, without interfering with your prospects of employment, give to the committee what you use in the manufacture of confectionery by Kehoe & Co., I wish you would.—A. What particular branch? What particular kind?

Q. Well, just give the ingredients of all of the common kinds of candy.—A. Sugar and cream of tartar and coloring matter. The coloring matter we buy from Germany. It is passed on by the Imperial Government of Germany. It is purely vegetable.

Q. Have you ever used aniline dyes?—A. No, sir.

Q. This coloring which you say you use is purely a vegetable coloring?—A. Yes, sir.

Q. Have you stated all that you use in the manufacture of candy?—A. Acids.

Q. What kind of acids?—A. Citric acid and tartaric acid.

Q. Are you a chemist?—A. No, sir.

Q. When you say you use citric acid and tartaric acid, then you simply use what you suppose to be citric acid and tartaric acid?—A. It is bought for citric acid and tartaric acid.

Q. That is what you buy it for. Did you serve an apprenticeship at your trade?—A. Yes, sir.

Q. With whom did you serve?—A. Kehoe & Co.

Q. You think you have now stated all of the things that you use? The coloring matter, you say, is imported from Germany and which you are informed and believe is purely vegetable?—A. Yes, sir.

Q. And you use no aniline dyes?—A. Not any.

Q. You use sugar?—A. Yes, sir.

Q. What kind of sugar do you use?—A. Mold A sugar.

- Q. That is a cane sugar?—A. Havemeyer's Mold A sugar.
Q. Do you use any glucose?—A. Yes, sir.
Q. Do you know anything about the kind of glucose that you use?—
A. Well, we use the best kind of glucose.
Q. You are not a chemist?—A. No, sir.
Q. You couldn't analyze it?—A. No, sir.
Q. Do you use any starch?—A. To make the molds with.
Q. To make what?—A. Molds.
Q. Well, to make candy?—A. No, sir; not a particle.
Q. Not a particle to make candy with?—A. No, sir; but to form the molds.
Q. Do you use any flour?—A. No, sir.
Q. Neither flour nor starch?—A. No, sir.
Q. You make a general variety of candy, do you?—A. Retail candy; yes, sir.
Q. Just for retail?—A. Yes, sir.
Q. Then you don't manufacture it to sell at wholesale?—A. No, sir.
Q. Do you use any terra alba?—A. No, sir.
Q. Do you know what that is?—A. Yes, sir.
Q. You have seen it used?—A. No, sir.
Q. Never heard of its being used in confectionery?—A. Not in the city.
Q. Where have you heard of its being used?—A. St. Louis.
Q. What would be the object of using terra alba?—A. To give weight to the candy.
Q. Have you stated all the kinds of acids you use in the manufacture of candy?—A. Yes, sir.
Q. Where is the glucose manufactured that you use?—A. By the American Glucose Works.
Q. Here in Chicago?—A. I believe it is in Chicago.
Q. It is called grape sugar?—A. No, sir.
Q. Or corn sugar?—A. No, sir; it is just called glucose.
Q. Just called glucose. You don't use any of what is known as flourine?—A. No, sir.
Q. Or corn flour?—A. No, sir.
The CHAIRMAN. I believe that is all.

STATEMENT OF CHARLES F. GUNTHER.

CHARLES F. GUNTHER, being first duly sworn, in response to questions by the chairman, testified as follows:

The CHAIRMAN. What is your name, residence, and occupation?

Answer. Charles F. Gunther. Occupation, confectioner. Business address, 212 State street.

Q. Before that you were in McVicker's Theater?—A. Yes, sir; and before the fire we were on Clark street. After the fire we were on the corner of Twentieth and State streets, and then came to McVicker's.

Q. How long have you been in your present business?—A. Since 1863. That is, in the business.

Q. You manufacture for the retail trade?—A. Retail and wholesale both.

Q. You manufacture both for the wholesale and retail trade?—A. Yes. Our wholesale goods are identically the same as we sell for retail. We make no discrimination. We get better prices——

Q. By retailing, of course.—A. In our wholesale goods we don't try to meet what we call ordinary competition. We fix our own prices and make our own goods.

The CHAIRMAN. This committee, Mr. Gunther, is instructed by the Senate of the United States to take up all questions of food and drink, and we consider confections a very important one, in view of its common use among the people, and I should say to you at the start that we have no desire to inquire into your trade secrets or to go beyond the scope of the resolution in any way. They want us to furnish them evidences of where goods are sold in fraud—that is, where a certain class of goods is sold for a different class. Also, and more particularly, to determine what, if any, adulterants or compounds are used that are deleterious to public health.

The WITNESS. I wish to say this, Mr. Chairman, that the confectioners' trade throughout the United States recognizes and knows the fact that there have been a great deal of deleterious substances and adulterations and inferior confectionery sold in this country years ago. Throughout the United States they have formed themselves into an association called the Confectioners' Association of the United States, with the sole object in view of shutting out and putting down every man who uses anything that is deleterious in our business, from the fact, not only from a humanitarian standpoint, but from the fact that announcement in the press or in general public information that confectionery was injurious. It was detrimental to the trade and an injury to the trade. Now, in doing this, in forming this association, the idea was to enlarge the trade and to disabuse the minds of the American people that there was anything sold in the way of confectionery, by the trade in general, that was injurious or deleterious, but, on the contrary, beneficial. We hold that good confectionery is beneficial and that sugar is beneficial.

The CHAIRMAN. Well, I should say to you right there that Dr. Wiley, and in fact every scientific man who has testified, agrees with you, from a scientific standpoint, that sugar is very nutritious to a great—

Answer. From the fact that to-day the European armies—part of their rations is sugar now, especially in the German army, which is probably the best looked after of any army in the world. We have formed an association, which has been in existence—the first meeting was held in Chicago—it must have been about ten or fifteen years ago. And there all the leading confectioners joined, and they exist to-day, and have annual meetings for the purpose of prosecuting anybody that we find in any State or anywhere who makes anything injurious. We have committees in every State, and have also—this general confectioners' association of the United States has caused various States to pass laws in favor of the association's purposes. Since then I know of no one in the trade generally who is using—anyone that we know of who is using—anything that is injurious; anyone who uses mineral colors, or these aniline colors, or terra alba, or the ethereal flavors; they have all been tabooed.

Q. If they use them at all, they do it without the knowledge of the association?—A. Yes. And another thing we do. Where the association hears anywhere, or where there is a report made that some one has got sick, or some child has got sick eating candy, if any child that has gotten sick has had any candy within twenty-four or forty-eight hours before that, the doctor comes to the conclusion that it must have been the candy that made the child sick. So that case is

at once investigated, and, as a rule, we find the first announcement was erroneous, or that that wasn't the fact at all. The fact is that anybody eating candy, if they were going to be sick over it, they would be sick within from fifteen minutes to half an hour, because as soon as digestion sets in, if there is anything deleterious about it, it takes effect immediately, and does not take effect from twenty-four to forty-eight hours after. And for that reason I speak of this association, because it is a great thing for this country. Since then vegetable colorings of all kinds have been used by the whole trade, both wholesale and retail, to the best of my knowledge.

Q. You mean that the association constitutes a large majority of the confectioners of the country?—A. Pretty nearly all of them. Almost every reputable confectioner in this country is in it. There is occasionally one who is not in it, but if he does anything that isn't correct, of course the association is after him. Those are the very men we want to look after—the man who will not come into the association; that's the man we want to watch.

Q. And the fellow who is in the association you don't get much opportunity to watch?—A. Well, on general principles they are honorable men. There is no class of men I know of in any trade who are more honorable than the wholesale confectioners of this country. There are a few small-fry fellows who work in cellars and one thing and another who make up cheap stuff; but there is nothing in it.

Q. Isn't it customary to consider it perfectly healthy to use a certain amount of starch in the manufacture of candy?—A. That is another thing. Starch isn't used in candies proper. Cornstarch is used in making what they call fig paste—that class of goods. Starch pudding is made in the same way; that is, of about the same material. There are so-called fig pastes, Greek or oriental or Turkish pastes, and gum drops of the same material, which are simply an imitation of the genuine gum drop, because they are cheaper. Starch is cheap. They are perfectly wholesome, just as wholesome as the bread we eat. There is nothing to it except cornstarch, and it is the same as eating cornstarch pudding or anything of that kind.

Q. There is a good deal of what is known and called cornstarch; that is a by-product of the glucose factory, and called flourine. Have you ever known of their using that of late years?—A. No. Starch is so cheap that I don't see what they could use any cheaper than starch, from the fact, of which you are probably not aware, that starch is an absorbent of water, largely. Now, water is about as cheap as anything you can get, and of course starch takes up a little of the water; so that it wouldn't pay to get any outside stuff. In the first place, they don't know how to handle it. They understand the manipulation of starch and they don't understand the manipulation of these other things.

Q. These dyes are vegetable dyes, you say?—A. Yes; all of them. And I want to say another thing, which is true, and it is a good thing for the country, that since these manufacturers have aimed at and are getting up what we call vegetable colors, and which they announce also in their announcements and advertisements have been analyzed by the first chemists of the country, who certify to their purity as being genuine vegetable colors—all of the manufacturers do that. Not one of the manufacturers of the country comes out without a lot of certificates of chemical tests to prove that his goods are made with vegetable colors and are harmless.

Q. What sort of acids are used in the manufacture of confection-

ery?—A. There is very little acid used in anything except, for instance, in acidulated goods. Lemon drops, or something of that kind, have a little acid flavor to them. They generally use for that citric or tartaric acid.

Q. Citric acid means an acid from citrus fruit?—A. Yes.

Q. Like the lemon or citron?—A. Yes; the citrus fruit.

Q. And tartaric acid is — A. Tartaric acid is a precipitate of the wine of the grape in the casks.

Q. That is what they make cream of tartar from?—A. Yes; and crystals are formed from that and then it is ground up. The confectioner has to buy the purest and best because he knows he gets what he pays for; but there is more or less of that kind of goods on the market. That is tartaric acid or citric acid that is adulterated with probably harmless stuff, but at the same time it is sold cheaper than the straight goods.

Q. It is cheaper whether it is sold cheaper or not? It is adulterated?—A. Yes; it is adulterated, but the trade can't use that. We have to use the pure thing.

Q. It is a physical necessity?—A. Yes; because the less powder of any kind you get into the article the clearer and the better it will be. In other words, you don't want to make it opaque. It wants to be transparent, and to do that the less you get in the better. At the same time, we know very well that if you wish a certain amount of sour, you have got to simply pay for what you get.

Q. You would consider, would you, Mr. Gunther, national legislation upon this subject of benefit to the people, and at the same time a protection to the honest manufacturer?—A. Yes, sir; there is no doubt about it.

Q. And you would be in favor of national regulation of this subject?—A. Yes, sir; I think it is a grand thing. We have it now in the whole country, with a few exceptions, as State laws.

Q. There is hardly ever any prosecution under the State law, is there, though?—A. No, very seldom. We never hear of any.

Q. And, as a rule, the ordinary citizen has a little more respect for a national law than he has for a State law?—A. Yes, that's right.

Q. Have you anything else to say that occurs to you, Mr. Gunther?—A. I wanted to say another thing. It is about this acid question. Cream of tartar—you might call it an acid; it is to some extent—cream of tartar has been very much done away with in the making of candies of all kinds, because glucose will answer the same purpose and is freer from acid, and makes better goods than the cream-of-tartar goods, because glucose is noncrystallizable, and in fact, it is a benefit to the trade and a benefit to the public.

Q. And perfectly healthy?—A. Yes, and answers the purpose and is cheaper, too. There has been a great increase in this country of chocolate. The increase, I believe, in the last few years, is 50 per cent or 100 per cent, and it is of benefit to the country and people to consume some chocolate, because it is a food as well as a flavor.

Q. There is a good deal of adulteration in chocolate?—A. Yes, there is or can be.

Q. How is that adulterated?—A. Oh, by using flour in it; that's all. Thin it down.

Q. Flourine?—A. No, not flourine; common flour.

Q. Putting flour in?—A. Yes, sir.

Q. It simply weakens it?—A. That's all; thins it down.

Q. But doesn't put in anything that is deleterious to health?—A. Oh, no.

Q. How long since you have heard of terra alba being used in confectionery?—A. I don't remember hearing of it for ten or fifteen years—since this association started. Since then it seems to have disappeared.

Q. I suppose the question could be accurately determined if I should take the Government chemist and buy samples in different places and have them analyzed?—A. Yes. There is this, too, about candy. Everybody thinks candy is all sugar. Now, candy is not all sugar, because candy, like cake, is all flour. You will pay 20 or 30 or 40 cents a pound for fruit cake. It is flour, but that is simply the body of it. The same way with candy. We sell a good article, absolutely pure, wholesome, nice candy, for 15 cents a pound, and it is good candy; none better; but it is all sugar, practically; whereas, the higher grades of candies are made up of all kinds of pulps of fruits and nuts and combinations that go to form these pastes. They cost lots of money. So you will find in eating nice candy that it is not all sugar; that it is the things that go in toward making it up that makes good candy.

Q. And in making that there is a good deal of extra cost in the labor?—A. Yes, and everything else connected with it.

STATEMENT OF JOHN BERRY.

JOHN BERRY, being first duly sworn, in response to questions by the chairman, testified as follows:

The CHAIRMAN. What is your name, residence, and occupation?

Answer. John Berry; 88 Warren avenue is where I live. My place of business is on State street, at Adams and State, 201 State; also 174.

Q. I think you were not here when I said to the gentleman who preceded you that I want simply to get the facts as to the adulteration of all food products. We have no desire to pry into trade secrets or interfere with any legitimate business, and if any question seems to you as leading into your private business you may say so and I will withdraw the question. Are you a confectioner?—A. Yes sir.

Q. Did you serve an apprenticeship at manufacturing yourself?—A. No, I never did.

Q. But you understand about everything that goes into your factory?—A. Yes; generally speaking, I do.

Q. You are the manager of that business, are you not?—A. Yes, sir. Formerly I used to make my own candies, but I never served any time on it.

Q. You have been at it some time?—A. Yes; since 1874, in Chicago.

Q. Will you state briefly to the committee, so we can put it in the record, what ingredients are used in your factory in the manufacture of candy, in a general way? I don't care for all the details.—A. Of course the body of all candies, as we know, is sugar, and next to that comes glucose.

Q. Which is another kind of sugar?—A. Well, yes; it is a substance which we understand comes from corn, but it hasn't got the sweetness of sugar. It has more or less body, so that it takes the place of the weight of the sugar. I don't believe it is at all injurious, but of course if it was all glucose there would be very little taste to the candy.

Q. You have to mix glucose with cane sugar, do you?—A. Yes.

Q. You use what is ordinarily called cane sugar?—A. Yes, sir; Havemeyer's Diamond A, Crystal A, sugar.

Q. Do you use any acids?—A. Yes, sir.

Q. What sort and kind?—A. We use the tartaric acid and the citric acid.

Q. And what coloring matters?—A. Just vegetable coloring matters. Burnett's we use.

Q. Are those made here in Chicago?—A. I believe they are; yes, sir. Colorings all come in bottles now. We have 4 and 8 ounce bottles, and they are all stamped, and they seem to be a great deal more particular now with colors than they used to be. They send written guarantees with them, saying that they are perfectly noninjurious formulas and made from vegetables.

Q. How long since you heard of the use of terra alba?—A. O, not for eight or ten years.

Q. The trade itself, as Mr. Gunther says, started a crusade against the use of that?—A. Yes; anybody we ever heard of who would use terra alba there was a fund of money in the treasury of the Confectioners' Association to prosecute those people, because they thought it was injurious. It is an earthy substance, as I understand, and it would sink and settle in the stomach and finally kill them if they used it much.

Q. Do you use any starch?—A. No, sir; only as molding—to form the molds, you know. We run the cream when it is soft into the starch molds and it does not run through there, but it remains there just like sand does for the molders; the same principle.

The CHAIRMAN. I don't think of anything else but what has been gone over. If you have any suggestions to make we would be glad to have them.

The WITNESS. There is a great deal of molasses that goes into confectionery. I think there is more molasses than anything, after the sugar and glucose; and in weight I think the next article would be peanuts, and everybody knows what peanuts are. They come from the South, and they are pretty nice eating when you get them all right. There are lots of dates, and figs, and raisins, and currants that are used in the candy business.

Q. As a rule you have to get the best?—A. Well, yes; we aim to get the best. We buy the most expensive figs and raisins we can get. There is a little machine which takes the seeds out, and then we either dip them in cream or chocolate, which makes a very nice eating confection. We pay as high as 22 cents a pound for figs. There is a little stem to every fig. We take those off and grind them up and make centers of them. We have a pistachio nut that costs \$1.25 a pound. It comes from Europe. They go into nougats. They are in some of the chocolates. It is a green nut. I have heard them spoken of as one of the poisonous colors in the pistachio—that it was colored green.

Q. That is the natural color of the nut?—A. Yes; we buy it for that color, because it is so different. We don't sell a great deal of the green-colored candy unless it be on St. Patrick's Day. We try to make a little display on that day. It is not injurious at all, but some people will not buy it.

Q. That is colored, you say, with the vegetable colors?—A. With a vegetable green.

Q. You don't know how these colors are made?—A. No, sir; I do

not. They are made here in Chicago, I believe. There are imported vegetable colors—quite a number of them.

Q. It is claimed now that all the coloring for confectionery is derived from vegetable sources?—A. Yes. I should think if the Government examiner would get hold of some of these colors and give them a thorough test that would settle the question. Half a dozen of the big firms. As Mr. Gunther said, the body of cakes is flour. In our preparations we put in all the best kinds of fruits we can get; also fresh fruits and jellies and jams. It is the object to make the candy look as pretty and beautiful as it can be, and to cater to the palate.

Q. In using jellies and jams you don't buy those ready made? You make those yourself?—A. Generally we make them ourselves. We get the crop when in season. We get strawberries, raspberries, and pineapples and boil them up and put them in jars.

STATEMENT OF M. SHIELDS.

M. SHIELDS, being first duly sworn, in response to questions by the chairman, testified as follows:

The CHAIRMAN. Will you state your name, residence, and occupation?

Answer. M. Shields, of the firm of M. Shields & Co.; 43 and 45 State street.

Q. How long have you been a confectioner?—A. Since 1870.

Q. Are you a practical man in your own factory? I mean could you go into the factory and do any part of the work?—A. Yes; I could go in and do almost anything. I don't do it, though. I oversee to a certain extent.

Q. I want to show your experience in the business. Have you worked at it as a trade?—A. Never; only overseeing it. I have always had a factory of my own.

Q. You buy your own ingredients that go into the factory?—A. Yes, sir.

Q. You personally know what the ingredients of your goods are before they go out?—A. Yes, sir; everything is of the very best that money can purchase.

Q. You don't use terra alba in any capacity in your factory?—A. No, sir; and I don't know of anyone that does in the city or outside of the city at present.

Q. Do you remember in your earlier life as a confectioner that that was one of the ingredients used?—A. It was only used principally in stick candy and drops, which were sent to the Western and Southern trade. There was but very little of it used in the Northern trade; but the National Association of Confectioners has done away with all that. They have done away with it, I should say, for about fifteen years. Mr. Gunther said, though, it was from ten to twelve; but I think it is fifteen years ago that they did away with it. Now, if there is anybody using it, it is done on the sly and unknown to the authorities, because if we heard of it we certainly would report it.

Q. Whatever is for the interest of the people is for the interest, of course, of the man who is an honest manufacturer and confectioner?—A. Yes, sir.

Q. And you would favor a national law that would protect the consumer and at the same time protect the honest manufacturer?—A. Yes sir; I think that would be a very good thing.

Q. Have you any personal knowledge as to your dyeing materials?—
A. Nothing more than what the gentleman has reported here.

Q. You buy your coloring materials. It is a very small percentage of what goes into the candy, I suppose?—A. Oh, very small, anyway; but I couldn't cover the ground any more than Mr. Berry or Mr. Gunther have already done.

Q. Do you buy the domestic or imported coloring matter?—A. We buy both.

Mr. GUNTHER. The imported colors all have, I think, the certificates of the Government chemist as to the purity of the different colors.

The CHAIRMAN. That it contains nothing injurious.

Mr. GUNTHER. Then it is harmless.

The WITNESS. That it is considered to be strictly pure, and they have to be when they pass the Government on the other side, and they can't live there unless they are.

The CHAIRMAN. We have other things that are imported into this country, like coffee and wine and beer, which, so far as the evidence shows here, can not be sold in their own country at all, but I understand you to say they have a certificate on each package or box containing the goods?

The WITNESS. Not on the packages; it must have a label on it.

Q. On the package or bottle?—A. Yes.

Q. That helps to sell the goods, doesn't it?—A. Yes; because we have all confidence that the goods are strictly pure.

Q. Anything that gives a certificate of character to your goods, or to my goods, whether it is flour or candy, helps us to find a market for them?—A. Yes.

Q. That is another argument for national legislation on this subject, is it not?—A. Yes; I should think it would be in this case.

Q. Take, for instance, our flour. We sold ten millions of barrels one year. Then a year ago we put on a Government certificate, and then we sold fifteen millions.

The WITNESS. The minute they see the trade-mark they know what they are getting when they buy. They know they are not going to be deceived. They have confidence.

The CHAIRMAN. The legislation I am proposing could injure no one who is an honest manufacturer of confectionery.

The WITNESS. Who is honest in his line of business.

The CHAIRMAN. Do you think of anything else, Mr. Shields?

The WITNESS. There is only one thing that I wanted to call your attention to, Senator, and that is, as far as your large and prominent confectioners in this country are concerned, there is but very little difficulty with those; but it is the people who are not known at all to the country who get a certain amount—in fact, 33 per cent of the goods that are used to-day are made in basements and cellars, and cooked over little stoves by people who don't know the first single, solitary thing about confectionery. A child will go up and buy that stuff and eat it, and that's how it gets sick. They will eat anything that is sweet.

Q. But the factories themselves are sometimes basements and cellars, where you feel that unhealthy things get into the candy by absorption and lack of cleanliness.—A. The way they have of making them is improper. We have to-day in Chicago alone at least one thousand concerns making candy in basements and in back alleys and cellars, and every other place; and that candy is carried in baskets and peddled all over the country and brought to the stands. They

make it and bring it to the fellow who has a stand and sell it to him, and he will buy anything as long as he can get it cheap. Those are the goods that are raising Cain in this country, and if the people who make them were looked after the big concerns have pride enough in themselves to turn out everything all right. But there is where the trouble comes. My idea of the candy manufacturers would be for the Government to put a license on them, and not give a license to any manufacturer that was not able to answer his questions to make candies. Then to have State, city, and United States factory inspectors, and if these fellows are not up to date take their licenses away. That would keep the factories clean and put the ingredients right under the eye of the Government, and give the country at large what they ought to have—pure food. That's what we ought to have.

(An adjournment was here taken to June 9, 1899, at 12.30 p. m.)

FRIDAY, June 9, 1899.

The committee met at 12.30 p. m.

Present—The Chairman.

STATEMENT OF MR. FRED PARST.

Mr. FRED PABST, being first duly sworn, testified as follows:

The CHAIRMAN. What is your name?

Mr. PABST. Fred Pabst.

The CHAIRMAN. Where is your residence?

Mr. PABST. Milwaukee.

The CHAIRMAN. What is your occupation?

Mr. PABST. I am a brewer.

The CHAIRMAN. How long have you been a brewer?

Mr. PABST. Since 1864.

The CHAIRMAN. Did you ever serve your time as an apprentice at the trade?

Mr. PABST. Yes, I went up through every branch of the business.

The CHAIRMAN. You consider yourself a practical brewer?

Mr. PABST. Well, I know—

The CHAIRMAN. I mean outside of being the proprietor?

Mr. PABST. Yes, sir.

The CHAIRMAN. You know the ingredients that go into the making of beer?

Mr. PABST. Yes, sir.

The CHAIRMAN. I understand you supposed this committee was still open and that you wanted—

Mr. PABST. That is what I understood; that is the reason I came down.

The CHAIRMAN. Well, so far as we could, we finished with the Chicago evidence. We finished yesterday, either the subject of beer or confectionery, I have forgotten which, but I am going to take the time, and if you have any statement you would like to make you may make it. First of all, you have been in the business a long time, what do you say as to a national law?

Mr. PABST. I think it would be a very good thing. I think it would be a very good thing.

The CHAIRMAN. It would assist the honest manufacturer?

Mr. PABST. Yes, sir?

The CHAIRMAN. And protect the consumer?

Mr. PABST. Undoubtedly.

The CHAIRMAN. Tell the committee just what kind of beer you make, for instance.

Mr. PABST. Well, we think we make the best beer in the world—we try to. We buy nothing but the very best of material and we have the best of talent, and we spare no expense in making as good as can be made. We do that in order, of course, to increase our trade and in order to give the public something that they want. And we claim that we make as good a beer as is made in any part of the world.

The CHAIRMAN. Do you use any preservatives in beer?

Mr. PABST. No, sir.

The CHAIRMAN. Glucose?

Mr. PABST. No, sir.

The CHAIRMAN. Do you use any salicylic acid?

Mr. PABST. No, sir; we do not.

The CHAIRMAN. Have you ever heard of its being used in the past?

Mr. PABST. Yes, sir.

The CHAIRMAN. How long since?

Mr. PABST. I think about eight or ten years ago, probably.

The CHAIRMAN. What was it used for then?

Mr. PABST. In order to preserve the beer—to keep it from getting rily, you know. That was before we—well, we didn't know as much about making beer then as we do now.

The CHAIRMAN. Do you use what is called—

Mr. PABST. We have facilities—

The CHAIRMAN. Do you use what is called the sterilizing process?

Mr. PABST. I know what you mean—

The CHAIRMAN. Do you use the process known as pasteurization?

Mr. PABST. Yes, sir; we pasteurize bottled beer.

The CHAIRMAN. And since that time you have not had any—

Mr. PABST. No, sir.

The CHAIRMAN. As far as you know about other factories, you could not give this committee any information as to their using it?

Mr. PABST. I do not think it is used in this country. I think that every brewer tries to make as good and healthy beer as they can—as they know how.

The CHAIRMAN. That is a good upright opinion you have of your people.

Mr. PABST. I do not know anything that a brewer can use that is cheaper than malt and hops. Another thing, the brewers can not be too careful about what they put in beer. The materials they use have to come in pretty large quantities; they can not bring it in in night-caps, and it would be subject to inspection. You could not put the things in secretly; you would have to do so publicly.

The CHAIRMAN. How about imported beer—what do you know about that? Excuse me for asking about matters of this kind, but the committee want all the information they can get. Some have testified that there is a preservative of some kind, either salicylic acid or something else, in imported beer. Have you any knowledge on that subject?

Mr. PABST. I have not; I only know that the imported beer is growing less all the time. I do not believe that there is over 60,000 barrels of ale and beer in wood and bottles imported into this country in a year. I do not think there is as much as that. There used to be a great deal more, I know.

The CHAIRMAN. You attribute that to the increase in the value of our beer?

Mr. PABST. Yes, sir; exactly.

The CHAIRMAN. Do you know, from reading or from experience, whether the law of—take the German laws—they are compelled to use a certain amount of hops and malt and so on; do you remember about what the law is?

Mr. PABST. I do not just know what the law is. I do not know about that.

The CHAIRMAN. I did not know but what you might know. I am getting some translations of the old-country laws. I have an idea that the laws of those countries would not fit the American situation.

Mr. PABST. The American test—

The CHAIRMAN. The American test—and the test might not apply to our situation, so that while we can follow those laws we might get some good ideas as to the manner of inspection.

Mr. PABST. I am not posted on that.

The CHAIRMAN. You have nothing further to give us, or any further suggestions to make? I suppose we can get samples?

Mr. PABST. Yes, sir.

The committee then adjourned subject to the call of the chairman.

OCTOBER 20, 1899.

The committee met in room 201, Grand Pacific Hotel, Chicago, at 10 o'clock a. m.

Present: The chairman.

STATEMENT OF HENRY C. PIRRUNG.

HENRY C. PIRRUNG, being duly sworn, testified as follows:

By the CHAIRMAN:

Q. What is your name?—A. Henry C. Pirrung.

Q. Your residence?—A. Columbus, Ohio.

Q. Your occupation?—A. Manufacturer of butterine.

Q. You have not been before this committee before, have you?—A. No, sir.

Q. I wanted to get, Mr. Pirrung, in a general way—not prying into any man's personal or private business, however—first, the ingredients and the general method of manufacture of your goods, if you will state them, and how it is made, so far as you know.—A. I think I can best explain that to this committee, Senator, by actually taking, as it were, a trip through our factory.

Q. Yes.—A. And first and foremost we will consider the ingredients as they are received by us from the packers.

Q. Yes.—A. It must be understood that we buy all our oleo oil and neutrals from the packing houses, not having any facilities for making our own raw material.

Q. As you use the words, let me ask questions. This oleo oil—that is a part of the beef product, is it not?—A. Oleo oil is a selected fat from beef that is usually obtained from the caul fat, and is in appearance a beautiful yellow, having a granular appearance, and looks very much like yellow butter. That is one of the principal ingredients, which we receive in nice new tierces direct from the

packer, second-hand tierces never being used by packers as long as we have been in the business, which is over twelve years. Now, the neutral which we receive is a beautiful white product made from the leaf of the pig only, and in taste is nut-like and in odor positively neutral; and I might state that the oleo oil is also neutral in smell. Now, we use those two ingredients just the same as a housewife would use flour in making bread—that is, the quantity. The yeast of butterine, as we term it, is the milk, cream, salt, and coloring. Now, those combined are churned in a nice steel or tin churn, mixed, as you might say, for twenty or thirty minutes, then flow into a bath of ice water, in which it congeals and gets the grain incidental to butter. That water must be absolutely pure or it will contaminate the product, and can not be used over and over again, as is often stated by other people who do not know anything about the manufacture of this product. Then it is put on to nice, new wash tables in order to let the water drain from it again; then it is immediately put on to the butter worker, in which the water is again worked out, salt added, and then it is taken into the rolling or printing room, as the case may be, and is finished up into beautiful molds and prints. Then it is wrapped either in new cloth—no shirt tails, Senator, in our factory—

Q. No what?—A. No shirt tails used in our factory at all for wrapping prints. Or nice new 30-pound vegetable parchment paper packages. The Government further prescribes that all oleomargarine must be packed in new wooden packages. Therefore, the second-hand oleomargarine packages are left for the use of the butter people. The article is then required to be branded with the word "Oleomargarine," specifically, in letters 1 inch high, the name of the factory, its location, and, in fact, the gross, tare, and net, and even the style of the prints must be put on the outside.

We are required to put a caution notice on to this package, advising the retailer to destroy the stamp and the manufacturer or anyone else not to use this package again for oleomargarine, under severe penalties prescribed by the Federal laws.

Now, you will readily see that it is absolutely impossible for the manufacturer, if he carries out the provisions of the Federal law, to sell that product for anything else than what it is. Actually it looks like a billboard when it goes from our factory with the words "Oleomargarine" on the stamp and the caution notice on the side and on the top. And then we are not satisfied. We put our own name and a label on the reverse side, so that no one can possibly be deceived.

I think that is about as near as I can explain the manufacture of butterine here without going through the factory.

Q. Do you use any preservative besides salt?—A. None whatever.

Q. None at all?—A. None whatever. Now, in that connection, Senator, if I may be pardoned, I would say that the ingredients entering into butterine are cooked, and therefore butterine, if made properly, will never get rancid, no matter how long you let it lie around. It will possibly lose its flavor or its taste, but it never will get rancid.

Q. It is heated to such a degree, I suppose, that it kills all the bacteria?—A. All the bacteria and the bacilli are killed, and therefore no preservative is needed.

Q. Your factory is not allowed to retail at all under the law, as I understand it?—A. Not under our manufacturer's license.

Q. I suppose you have heard the evidence that was given here before? There were statements made here before by some people

that it was customary to sell butterine for butter.—A. I was summoned here rather unexpectedly and only know what I read in the papers last spring. That is perfectly ridiculous, and I think is an insult to the intelligence of the American people, because, as I said in regard to the manufacturer's packages, the Government prescribes for a retailer that he must stamp the paper; that in several States, notably Ohio, he has to have a placard advising the people that oleomargarine is sold at his place, and, in addition, he is required to stamp the ingredients as furnished by the manufacturer; and I don't see how a person possessed of the five senses can possibly buy butterine for butter, especially if they keep posted as to the price.

Q. Can you tell about how many pounds of oleomargarine are manufactured annually in this country?—A. Only that I read from the statement of the Internal Revenue Commissioner that there were about 80,000,000 pounds made last year.

Q. And how many pounds of dairy or farm butter—that is, marketed?—A. There is something like 5,000,000,000 pounds.

Q. Where did you get those statistics?—A. I read them from the Board of Trade Review here not long ago. I know that the production of oleomargarine as compared with butter in this country is just a fraction over 5 per cent. So it is a very limited quantity after all.

Q. And yet the demand is there?—A. Yes, sir.

Q. For this 80,000,000 pounds of butterine?—A. Yes, sir; it is, and as far as my vast experience of twelve years is concerned, and in which I have been engaged in nothing else except this business, I find that there are two very distinct classes using butterine only. The first and foremost class is the intelligent, who buy it from choice. They know what it is composed of. They have got through reading this silly rot as published by each and every dairy journal purporting to be the farmer's friend. They buy butterine on account of its keeping qualities and the cleanliness in its manufacture, and they know its merit. That is the first and foremost distinct class using butterine. The second class is the class that buys it from necessity. They can not afford to go on the open market and pay perhaps 25 and even 35 cents a pound for butter, but are compelled to give their children something perhaps of equal merit at a less cost.

Q. What coloring do you use?—A. We have used nothing but a vegetable coloring made by Chris Hansen's laboratory, which is made from the annatto bean, from the vegetable colors which are made under our own formula.

Q. Is there anything else that you use in it that you haven't mentioned?—A. No, sir. I wish, in passing, you would ask me whether we use anything that we consider deleterious to health.

Q. That is what I am getting at. I want to know whether you do, and then I want to know what you use, so that the committee can see whether it is deleterious to health. As far as dyes or colorings are concerned, there are no chemical dyes used in your factory? It is a purely vegetable dye, is it—no chemical dye used?—A. It is purely vegetable.

Q. And in the meat products you have described you say no preservative—nothing but salt?—A. That is all.

Q. I will put the broad question: You have stated practically everything that you use in the manufacture of butterine?—A. Yes. I will state that again. It is oleo oil, or beef fat, natural or pork fat, milk, cream, salt, and coloring. That is all we use. Now, in answer

to whether we use anything deleterious to health, I was going to say that the very best and foremost testimonial is furnished us by the food commissioners of the United States, who have never in the history of oleomargarine attempted to say that anything deleterious has been used in its composition. If we had, they would have run us out of business long ago.

Q. When you say food commissioners of the United States you mean of the different States?—A. Yes; the different States.

The CHAIRMAN. I would like to have a food commission of the United States, if I can, and have uniformity in all matters of food products. I don't know whether I will succeed or not, but that is one of the objects of this investigation.

Q. Could you furnish this committee or furnish me for the committee with some of the statements and testimonials of different State commissioners who have, for instance, analyzed this product?—A. Can I furnish them?

Q. Would it be any trouble for you?—A. No; I can furnish you their annual reports to their several governors, which they are compelled to make.

Q. If you could send them to me I would be very glad to have them. I think it would be well to embody them in this evidence.—A. I would be very glad to cooperate with this committee in anything that I can do.

Q. They want to know, first of all, if there is anything deleterious to health, and secondly, if there is any fraud on the people.—A. Now, for the benefit of this committee I will say that there is no fraud perpetrated on the people here. Of course we will admit that there is a similarity in appearance between butterine and butter. They look identical because they are both colored, and they are identical as regards their constituents. For instance, deduct the salt and water from butter. A chemist will say: "Here is a residue of 100 per cent fat." Now, then, deduct the water and salt from butterine. A chemist will say likewise: "Here is a residue of 100 per cent fat." The butter has a residue of 100 per cent fat, raw fat. The butterine has a residue of 100 per cent of cooked fat. Microscopically they are identical. Chemically they differ somewhat, but it must be remembered that they are both distinctively animal fats. Now, then, they say that we make butterine to imitate butter. That is ridiculous, again, because butterine is as distinct from butter as wool is from cotton or steel from iron. We consider that our product is a product of the advanced age. Science has effected this.

Q. Have you a food commissioner in the State of Ohio?—A. A very prominent one.

The CHAIRMAN. I have been reading about so many that I have forgotten individual ones.

The WITNESS. Yes; a very prominent one.

Q. Has he analyzed the products of your factory?—A. He has repeatedly, and so has every one who preceded him, and in no instance have they found anything deleterious to health, but, on the contrary, they say that they, if they had the choice to dictate what shall be used, would say that butterine should be used in preference to what they term the ordinary butter. But they say, inasmuch as there exists on the statute books a law prohibiting the coloring of butterine, they are bound to enforce it, and it is true they cause us a great deal of trouble.

Q. Is that a State law?—A. That is a State law.

Q. There have been some recent decisions in regard to that matter, have there not, in the courts?—A. Some very prominent decisions, and particularly lately, notably one in Michigan, which was decided by the highest court there, declaring—well, the law stated that if an article is colored, coated, or powdered, whereby damage or inferiority is concealed, or whereby a product is made to appear better than it really is, it shall come under the ban of the food laws; but that law, as far as oleomargarine is concerned, has been declared unconstitutional, because they say that the introduction of coloring in butterine does not affect its quality, does not make it any better, does not create a greater price for it, and does not conceal any inferiority, and therefore it does not come under that act at all. That is a very late decision.

Q. Do you think of anything else you would like to say?—A. I was hastily summoned before this committee, as I said before, and not knowing what they expected of me, I searched my memory as best I could from reading the newspaper articles of last spring, and I think I can reply to at least some of the charges made here in regard to coloring, particularly, as that seems to be the only deleterious substance, as they term it, used in oleomargarine, or, as I find Charles Y. Knight says, "adulteration." Now, if the Encyclopædia Britannica is looked up you will find that an adulteration is where an article has been debased, made inferior, or loathsome; where its standard has been lowered. I think the term is illy used, because if we do use color at all it is to create a better appearance, to enhance its value, so I think he had better look up a better word than adulteration. Now, I made a note here that butterine manufacturers have just as much pride in their business as any other manufacturer, be he a goldsmith or clothier or a producer of any food; and naturally they want their product to appear as salable and as sightly and as popular as it is possible to make it, and therefore the introduction of coloring matter from the time that the very first pound of butterine was made twenty-five years ago. Never in the history of the making of oleomargarine was there a pound of butterine made that was not colored. Your own recollection will serve you that twenty-five years ago butter was of checkerboard hue, when seen on the bench or store counter, and lately it is colored universally, and I can speak positively about that, because we operate four creameries, having over 500 dairies contributing milk to these separate creameries, and every pound of butter that we make during every year is colored.

Q. Then you make creamery butter besides?—A. Oh, yes.

Q. But in another place entirely?—A. Yes, sir. They are located from 10 to 32 miles west of Columbus, and are separate and distinct. Now, I will tell you why we created those creameries. Formerly we had contract with milk and cream shippers, and when milk and cream was in abundance we could get milk at a reasonable price, but when the article became scarce milk was diluted and cream was diluted, and we couldn't get the quantity that we desired. We were forced, therefore, to build our own creameries in order to supply our butterine houses. Another thing: If we would go down on the street and select five or six tubs of fancy fresh creamery butter, by the time our wagon would get around to collect it we would have about five or six tubs of ancient butter that nobody knew where it was made, or anything about it. Now, on the subject of color, I would cite this committee to the fact that fine confections are all colored.

The CHAIRMAN. Yes; that is the evidence already before the committee.

The WITNESS. And I can safely say that we will all agree here that they are not colored to improve their taste, and that they are simply colored to create a favorable impression on the eye; but the eye being in direct communication with the stomach, makes the confections more acceptable, heightens the appetite, and so on, and creates perhaps a demand from a passive consumer that an ordinary piece of white candy would not do.

So it is with butterine. We desire to create a demand. We desire to attract to our product. And then, again, we desire to put the consumer of butterine, whom I classed as one using it from necessity, on a parity with his wealthier neighbor. To illustrate: The rich man's daughter may go to school with her bread buttered with a nice rich golden piece of creamery butter. The poor man's little child goes to school with her bread buttered with a white-appearing substance which nearly everybody knows, if this color law were firmly enforced, would be butterine, and she would be criticized, perhaps, for using an inferior product, or, rather, a cheaper product, just the same as the rich child now criticizes the poorer ones for wearing gingham aprons while the others have silk. But the coloring of butterine puts the poor child on equal terms with the rich one, as far as its lunch basket is concerned at school. Now, it is my opinion, Senator, that a law forbidding the coloring of butterine would deprive the citizen of his constitutional right as prescribed by this Government.

The CHAIRMAN. I saw a synopsis of this decision. Does not the decision lately rendered go to the fundamental question of the constitutional rights of the individual? Was it upon the ground that the law lacked uniformity in permitting the coloring of one article and not of another, or was it because of an inherent right? You don't remember the ground?

Answer. I would answer that by saying that most of the decisions have been based on technical points, such as the improper headlining of the bill, and then bringing cases under clauses of enactments that do no pertain to butterine at all. For instance, the one cited in Michigan. But a real good point by the United States Supreme Court has never been taken, to my knowledge, on the question of coloring matter. Did you want me to go on with what little notes I have?

The CHAIRMAN. Anything you want to offer.

Answer. Have I all the time I want?

Question. All the time you want. I want the committee, when this evidence is printed, to have all sides of every man's case. I don't want to do an injustice by reason of lack of information. I want all of your side of this question. We have had the other side, and I want to get every man's side and give every man a fair show.

The WITNESS. I think it has been stated to this committee that oleomargarine is a cheap and inferior product, which in my estimation is about the silliest thing anybody could say. It is a positive fact that about eight months in the year butterine sells for more than the average grades of butter, and it is not an inferior product, because if it were inferior to butter every oleomargarine factory in the United States would be closed down for the reason that there is already an incalculable amount of poor butter or valueless butter on the market which is unsalable and which, if butterine were as cheap or as illy made as that, would deprive the manufacturer of the sale of butter-

ine, and therefore the factories would naturally be compelled to close down.

Now, the fact is that every manufacturer of butterine makes his product an improvement over butter, which naturally has created a sentiment in favor of it and increased its sale.

Much has been said here regarding the State laws, and great braggadocio has been brought forward over the number of States which have laws curtailing the sale of butterine in them and dictating its ingredients, as to what shall' and what shall not be used. In my opinion these vicious laws are an incentive for the oleomargarine dealer to hide his product, and, if anything at all, to sell it upon a technical inquiry without giving the information that it is butterine, and so on; but those cases even are very rare, as retail dealers in butterine are proud of the product they are selling, and are glad to sell it for what it is.

I would like to cite the Pennsylvania statute as it existed a year ago. That statute passed an absolutely prohibitory law, prohibiting the manufacture and sale of butterine in any form or in any character. It is a well-known fact that the western part of Pennsylvania is dependent upon butterine sources for its food supplies entirely in that respect. What would they do without butterine? And it was a foregone conclusion that when they passed that law butterine would be sold anyway.

Now, think of the dealer's position who had a demand for this butterine. The Government compelled him to stamp his name, his address, and city in which he lived, and the word "Oleomargarine" in one-quarter inch letters on every retail package, or he would be subjected to severe penalties. If he complied with that Federal law the State accepted that as positive proof that he sold oleomargarine, and he will be fined \$100. What was a retail dealer to do? There is no consistency in such legislation.

The CHAIRMAN. The one compels him, if he sells at all, to conceal the fact, and the other, if he sells at all, compels him to advertise the fact.

The WITNESS. It was just like a father telling a little son to go north and a big brother meeting him down on the corner and saying to him: "If you go north I will knock your head off." What is the little boy going to do? He is going to do as he pleases. Now, it has been said here that the oleomargarine business has been conducted in a sly, underhanded manner—trying to sell it, trying to conceal it from the public gaze, and so on. Nothing would do this committee more good than to take a carriage ride (and I am sure Mr. Moxley will pay for it) and come over and see the houses that he has got placarded here—half sides of buildings—with "Moxley's butterine." Then let them go along the L and the surface roads and see the signs of Brown Fittz's butterine. Let them go to the stores and see the numerous signs of Swift & Co.'s, Armour & Co.'s, Hammond & Co.'s butterine.

There is nothing at all secret about that, to my knowledge. I know that fabulous sums have been paid for advertising, and just hastily I picked up a few cards, and that card [handing a card to the chairman] we have over 5,000,000 of them printed and circulated throughout the United States, and we had 2,000,000 copies of this one [handing another card to the chairman] printed and circulated throughout the United States within the last year. It doesn't say anything about butter on there.

The CHAIRMAN. No; it says, "Purely Butterine." The word "Butterine" is in the largest letters there.

The WITNESS. Now, take up that there, Senator, and you will find on there a cut of the wagon which shows a brass plate there 48 inches square on the side, with our name on there, and in the corner you will find another plate about 4 feet high by 16 inches wide, with the word "Butterine" on it. We have four of these wagons that parade the streets of Columbus continuously from morning until night. There is no concealment of the fact that these wagons carry butterine. There is nothing hidden about it. We are not trying to conceal anything. Now, it is an established fact that fabulous amounts have been spent to advertise and bring prominently before the people of the United States our product. There is nothing under-handed and nothing concealed about the manufacture or sale of it, except when a man wants to find out about it and encourages a man to buy butterine for butter, as has been detailed here in your investigation.

Q. Just right there: What is the amount of tax per pound?—A. Two cents a pound on every pound that is made.

Q. Now, that is the first tax you pay, is it?—A. That is the tax on the product. The manufacturer's license is \$600 a year, the wholesaler's \$480 a year, and the retailer's \$48 a year, payable in advance. Now, right on that subject, Mr. Chairman, we consider it a gross injustice to tax a food product, or even our product of butterine, because we say that if it is not wholesome, if it is not fit for human consumption, the Government should exterminate its manufacture; but if the Government prescribes its manufacture—

Q. Permits it, you mean?—A. No; prescribes it, provided it is made in a satisfactory and healthful manner, I don't think it ought to be taxed at all, because that tax simply comes out of the consumer's pocketbook. Of course you understand, I think, that that tax is simply intended as a regulation to assist in having it sold for what it is. That is the object of the taxation; and that was sustained as a revenue measure, and I think the point was made that there wasn't tax enough to produce revenue enough to pay the Government for the worry and trouble of collecting it; and it was held in that case that while it did not produce much revenue, that the ultimate end and object of the tax was to regulate.

Q. In other words, you feel that it ought to be regulated and sold for what it is worth?—A. Decidedly so.

Q. But you feel that it ought not to pay a tax to the Government. I can see the ground upon which you take your position.—A. No, Senator; in my opinion, of course, I think that this product should not be regulated for no other reason but to please the element which is continually endeavoring to stir up some sort of legislation against butterine. Now, this element is no doubt composed of people engaged in the publication of dairy periodicals, for selfish gain, I guess, only. The other element is the commission-house element, who lose the sale of butterine to butter manufacturers because they could not and would not furnish a good article; and the third is perhaps an element that does not know anything about it. For that reason a regulation should be on this product, in my opinion, but it should not be at the rate of \$48 a year, and I think that a tax of \$12 a year, to serve as a register, to serve for the purpose of identifying the location of the dealer in the city or village, is all that is necessary.

Q. What does the manufacturer have to pay?—A. \$600 a year before he turns a wheel, on the 1st of July.

Q. And then the wholesaler—how much does he have to pay?—A. \$480 a year.

Q. And the retailer—how much?—A. \$48 a year.

Now, so far as the 2-cent tax is concerned, that may or may not be left on, because it does not cost the manufacturer anything. He adds that on the price of the product, and the consumer pays for it, and it is only reasonable and businesslike. I think the registration through a license of \$12 a year would be entirely sufficient. It is not necessary to charge \$48; but that is a matter for Congress to determine, and not ourselves. Now, another great cry that has gone up here by these farmer protectionists is that the farmer is suffering because butterine has taken the place of butter. Well, I don't know anything that goes into the composition of butterine that does not come from the farm in some place or other, except, perhaps, the tin fasteners, which are hardly to be mentioned for value. The rest of it all comes from the farm in some shape or other.

I can't recall the professor's name in Wisconsin, but I can furnish this committee with his name later on, who declares that rancid butter is absolutely poisonous, and I defy anyone to ever mention having seen or even heard of a piece of rancid butterine. And it is just as impossible to make butterine out of it, composed of putrid fats, as it is to make a whole coat out of torn cloth. So that that statement about butterine being made out of rancid and putrid fats is absolutely ridiculous, and is another insult to the intelligence of the people.

Now, Senator, I think I have gone over all the notes I made here. I will be very glad to answer anything further that you would like to ask.

The CHAIRMAN. I have been trying and hoping to get some description of this process of making over what is known as putrid butter. They have a system of gathering it and working it over, rechurning it, and so on. Do you know anything about that? Have you ever seen it done?

Answer. No, sir; from the fact that they do not permit anybody to enter their factory, I don't know. The nearest that you would care to come to their factory is to the edge of the smell, which is quite remote from the factory, and they don't let you get any further than that. There is a business I would like to see how it is done.

The CHAIRMAN (addressing Mr. Knight). You were going to look that up for me.

Mr. KNIGHT. I gave you the names of some of the people in that business.

The WITNESS. You are at perfect liberty to look into that.

The CHAIRMAN. I don't know that there is anything in that that requires investigation, but I remember now that you did give me the names.

The WITNESS. I would like to state that it is a matter of vital importance to this committee to get hold of that business.

The CHAIRMAN. I think it certainly can not do any harm to have the facts.

The WITNESS. I think they have a product—I think that if a product is colored to conceal its real character, that that so-called renovated butter is an article that comes under that head. Renovated butter is the term applied to it by Food Commissioner Wells, of Penn-

sylvania, and I think he was right. I think he was awarded a medal for the cognomen that he gave that butter.

Q. Do you think of anything else that you wanted to say on that side of your case?—A. Well, perhaps, in regard to that 10-cent tax law, which is being agitated by some paper—I don't know its name—Mr. Knight is editor of it. Is it Knight or Dark? It's the same, anyway.

Q. What is the name of that paper?—A. Mr. Caylor carries a file around with him.

Mr. CAYLOR. I didn't bring it with me.

Mr. KNIGHT. The Chicago Dairy Produce.

The WITNESS. That is the paper.

The CHAIRMAN. What have you to say in regard to that proposition?

The WITNESS. I have just recited who passed the tax of 2 cents a pound that is now imposed on butterine. The wholesaler pays it. He pays that. Who would pay that 10 cents a pound? The manufacturer? No; the same two classes that I cited before—the class that would enjoy butterine because they know of its merits, and the class that is compelled to buy it because they can't afford to pay the high price of butter. In other words, it would deprive that class from buying just exactly what they want, and nothing would be gained by it; nothing at all.

Q. Was the proposition made to tax it all 10 cents instead of 2 cents, or simply to raise the tax upon that which was colored?—A. There are two opinions expressed. The one formerly expressed was to tax the colored product, and then somebody thought to tax all of it. I think the first proposition is the more ridiculous of the two, because it would actually put a premium on a man's taste, on his desires. For instance—

Q. A premium or a tax?—A. Sir?

Q. You mean a tax?—A. A tax of 10 cents a pound.

Q. On his taste for the color of his food?—A. Yes. Why should a man pay more for a black woolen suit than he should for a gray woolen suit? How ridiculous. How unconstitutional, at the same time, if the Government should put a tax on black woolen cloth over gray woolen cloth.

That is about all I can think of, Senator.

STATEMENT OF W. E. MILLER.

W. E. MILLER, being duly sworn, answered as follows in response to questions by the chairman:

Q. What is your name?—A. W. E. Miller.

The CHAIRMAN. I said to some one—several months ago—representing your people here before this committee, that as soon as I could I would give your people a chance to testify before the committee, and for that reason I am here, and I want simply to inquire for the benefit of the committee, without going into matters in a prying way or asking you to testify to anything that you would consider improper.

Q. Your business is what?—A. Manager of the butterine department of the Armour Packing Company, Kansas City.

Q. Haven't they a factory here?—A. No, sir.

Q. Is that the same Armour & Co., the same firm, practically, as the one here?—A. It is a different corporation altogether.

Q. You are the manager of that concern?—A. Yes, sir.

Q. Then you know what the product is and all of its ingredients?—
A. Yes, sir.

Q. And also your methods as to putting it on the market?—A. Yes, sir.

Q. I wish you would state, Mr. Miller, for the benefit of the committee, the ingredients which you use.—A. I had a statement type-written this morning, as I thought perhaps I could get it more correctly than by speaking extemporaneously.

The CHAIRMAN. You may read it and then hand it to Mr. Taylor, the stenographer.

(The witness then read his statement as follows:)

Butterine is composed of the following ingredients: Oleo oil, neutral, butter, cream, milk, and salt, and highly refined cotton-seed oil is sometimes used in limited quantities in the cheapest grades.

Oleo oil.—The first ingredient is made from the caul fat, which is the richest and choicest fat of the beef. This fat, amounting to about 40 pounds to the beef, is taken out before the animal is skinned, thoroughly washed, and thrown into a vat of ice water (to get the animal heat out), where it remains until the following day. It is run through a machine which chops it up fine and then cooked. After the cooking process is over the fat is cooled, placed in linen cloths, and put into a hydraulic press and the oil extracted. The residue in the cloths after pressing is commercially known as "stearine."

Neutral.—Neutral is the leaf lard of the pig. The leaf, amounting to about 5 or 6 pounds to the pig, is taken out as soon as the animal is killed, thoroughly washed, and put into a freezer, where it remains twenty-four hours. From the cooling room it is taken and run through a machine which cuts it into shreds and then cooked. Neutral is snowy white, without taste or odor. Both pigs and cattle are examined by Government inspectors before and after killing, thereby insuring protection against diseased animals. England, France, Germany, Holland, and many other foreign countries where butterine is manufactured more extensively than in the United States depend entirely upon American packers for oleo oil and neutral.

Cotton-seed oil.—This oil is extracted from selected cotton seed and then highly refined. It is a pure, sweet product and is used quite generally for cooking purposes.

The process of manufacturing butterine is a simple one. The ingredients as named are churned together for thirty minutes in large steel churning. After churning, the butterine, which is then in a liquid state, is chilled by passing through ice water, worked thoroughly to get the moisture out, and packed in tubs and cases. Every package is stenciled "Oleomargarine," gross, tare, and net weight, number of factory, and district. A revenue stamp of 2 cents a pound is pasted on the tub or case, together with all the requirements of the law. In addition to the 2 cents a pound tax, manufacturers pay a license of \$600, wholesale dealers \$480, retail dealers \$48 per year. Each sale by a manufacturer is recorded in a book for that purpose, stating name, address, and amount. Every pound of material used is also reported in this book, one copy of which goes to the collector of the district in which the manufacturer is located and another copy to the Commissioner of Internal Revenue, Washington, D. C.

Butterine is colored by what is known as Wells-Richardson improved butter color, which is indorsed by the Chicago Produce Review, the Elgin Dairy Report, and all other creamery journals, and is used almost exclusively by every creamery man in the United

States. A very infinitesimal quantity is used in butterine. Butterine is not colored to resemble butter. When we commenced manufacturing butterine, in 1881, our first product was highly colored, but not to imitate butter, because very little of the natural article was colored at that time. In the winter it was almost white; in the summer it was a light-yellow or natural-grass color. Since the advent of butterine the creamery men have found it necessary to imitate it, because consumers considered butter more pleasing in appearance and just as palatable.

All cream, milk, and butter used are the best that can be purchased, and especial attention is given the handling of cream and milk. Salt used is the celebrated Ashton brand, imported from England.

Everything in the process of preparing oleo oil, neutral lard, and manufacturing butterine is scrupulously clean. All vats, trucks, tables, molds, and floors are thoroughly scrubbed with hot water once or twice a day. None of the laborers are allowed to use tobacco while at work and cleanliness is enforced on every side. Each tub is steamed and scrubbed in hot water before being used.

I would like to read into this testimony, with the Senator's permission, a number of testimonials given by certain noted chemists of the United States. We have Wiley, our Government chemist. We have Atwater, Chandler, Barker, and several others. I haven't those testimonials here to-day, but I can send them to you.

The CHAIRMAN. I would be glad to have them, and file them.

The WITNESS. They all recommend butterine very highly, and they have all gone into its formula and chemical standpoints. Another thing: Butterine is preferred by many people on account of its keeping qualities. It is used in certain districts, notably in tropical districts, on account of their not being able to use butter. I have seen our butterine kept for six months, and when taken out of the package it would be just as sweet as it was when put up. It has perhaps lost somewhat of its butter flavor, but it had still its sweetness. It never gets rancid.

Q. Do you use any preservative besides salt?—A. No, sir; and there is nothing at all secret in the process or in the sale of the goods. We have spent as high as \$25,000 a year in advertising our butterine. Our billheads are labeled butterine, and we have out advertising matter, and we have up large signs, and there is nothing whatever secret in the marketing of the goods.

Q. Where do you get your milk and cream?—A. We get them from the local creameries.

Q. You do not make dairy butter, too, do you?—A. No, sir.

Q. You say they sometimes put in butter?—A. Butter is always used in the better grades.

Q. Mr. Miller, do you think of anything else you would like to say on the subject of oleomargarine?—A. Perhaps I can enlarge on the point of butterine being sold for butter. We consider butterine is an article of merit, and people call for it because they want it, and it is sold for what it is worth. It is sold in the summer time to a great many people who can't afford to have ice boxes, and who buy it because it keeps, where, if they had butter, they could not keep it. Years ago it might be said it could be sold to advantage for butter, but at the present time it is an article of distinct merit. People call for it and they want it. You understand, Senator, that the retailers are required to brand oleomargarine on every pound sold.

Q. What is this package here [referring to a bucket holding some product]?—A. That is a 10-pound package of butterine.

Q. Do you think of anything else?—A. I don't believe I think of anything else.

The CHAIRMAN. There was some evidence taken on that side of the case by Senator Harris the day I went out West. Was there some one testified from Mr. Moxley's place as to the manufacture?

Mr. MILLER. No, sir.

The CHAIRMAN. Have you some one here who knows more about the ingredients?

Mr. MILLER. No. I guess I probably know as much about it as anyone around our place.

STATEMENT OF JOHN DADIE.

JOHN DADIE, being duly sworn, in response to questions by the chairman, testified as follows:

Q. What is your name?—A. John Dadie.

Q. What is your business, Mr. Dadie?—A. General manager of the William J. Moxley Butterine Company.

Q. Where do you live?—A. In Chicago.

Q. What part of the city?—A. 63 and 65 West Monroe street.

Q. Have you testified before this committee before?—A. No, sir.

Q. Were you here the day that Senator Harris examined some witnesses?—A. Yes; I was present that day.

Q. But he did not examine anyone calling out the facts that I am now asking about from those other witnesses?—A. No; I believe not.

The CHAIRMAN. I told some one representing you, the day before I went to Kansas, that Senator Harris would hear the evidence on this side of the case that day, or that I would later, during the summer or fall. Your business is on hearing here and different suggestions are being made as to legislation, and I would like to have you state, for the benefit of the committee, what your oleomargarine is made of—what the ingredients of it are.

ANSWER. Senator, I have listened to the evidence of the two former witnesses, and to their story as to the method of manufacture, the ingredients of which butterine is composed, and it is practically the same story of each manufacturer in the business. The ingredients that we make butterine from are oleo oil, neutral lard, milk, cream, butter, color, and salt.

Q. There is one thing that has not been settled yet that I thought of asking, if I don't interrupt you. When this churning process takes place, is it heated? Is that the time it is cooked? Are all those things heated?—A. No; that—we take these ingredients and heat them, and it will be necessary to do that in order to churn them and get a proper plant. Now, a great deal has been said in regard to the question of color, and I understand there is going to be considerable agitation in Congress in regard to that very thing. The color that we use is called the Wells-Richardson Improved Butter Color. I am not familiar with their method of manufacture or how it is made, but we simply desire to state in that matter that it is a color that we understand is used by almost every creameryman in the Northwest, and possibly throughout the United States. We find it advertised extensively in the paper called The Chicago Dairy Produce, and with your permission I would like to read one or two of their advertisements here.

The CHAIRMAN. I have no objection.

The WITNESS. I do that for the purpose of demonstrating the fact that the butter men are using the same identical color that is used in the manufacture of butterine.

(The witness here reads advertisements as follows):

Hear from Two States. Wells-Richardson Company's Improved Butter Equal to any Fancy Butter. Prize-winners in Indiana and South Dakota use the kind that has no mud.

In Indiana, Herbert Newby, on Wells-Richardson Company's Color, scored 97. In South Dakota, N. Simonson scored highest with the improved butter color, his score being 98.

Second and third, and in fact nearly all the entries contained Wells-Richardson Company's Improved Butter Color.

That, I presume, was the result of an exhibit at a State fair, in which they were scoring butter.

Here is another under date of October 14:

Use the best. Made the prize-winning butter. Highest two scores at the great St. Louis Fair.

H. B. Olson, Hutchinson, Minn., scored 98 $\frac{1}{2}$.

J. P. Howell, highest score 98 $\frac{1}{2}$.

Their butter contained Wells-Richardson Company's Improved Butter Color. So did all the other high-scoring entries.

I simply read this for the purpose of demonstrating to your committee the fact that we use this same color that is used in all creamery butter. I wish to state, too, that we buy our oleo oil from the packers. It is received in packages such as has been explained to the committee by a former witness, but in making neutral lard we make our neutral lard ourselves. It is brought in, chilled, run through what is known as a hashing machine, rendered out at a temperature, strained, and put through a cold bath, which is known as a curing process, and is used in making butterine at the end of about three or four days. At the end of that time it is properly cured. The curing results in giving us a snow-white article absolutely without any flavor and almost tasteless. In our high grades of butter we use a certain amount of butter. We formerly used butter in all the grades that we made, but we found it was so hard to get butter to do it that we had to resort to other methods of securing the proper results. Now it is customary to use milk and cream instead of where we formerly used butter.

Q. Mr. Dadie, there has been a good deal said here before the committee as to the manner of getting it into the hands of the consumer and the numerous evasions of the law in selling packages that do not show what they are. Do you know anything about that?—A. Yes, sir.

Q. You are not a retailer, are you?—A. No, sir; we are not retailers, but we are very close to that part of the business. We know this much about it, that every package of butterine that leaves our factory is marked and branded as this one (indicating a package on the table). This came from our factory. There is the original stamp. The Government requires that brand on it.

Q. Just read it.—A. "Oleomargarine. Factor No. 5, First District of Illinois."

We then further brand them with the grade of goods. That is what we call an extra fancy. The gross and the net weight of the package are also on it.

Q. The gross weight includes the package itself?—A. Yes, sir.

Q. And the net weight is what? Just the butter, I suppose.—A. Just the butter. I also want to call your attention to the labels on the sides of these packages. These labels are also prohibited by the

internal-revenue law. You will notice there the regular tax stamp of 2 cents a pound, which we are compelled to pay. There is a caution notice, cautioning a person against using the package a second time. And then, in addition to that, we put on another stamp: "W. J. Moxley's Finest High Grade Goods made." So a person in buying that package appears to me to be very ignorant if he is unable to tell what the contents of it would be. The complaint which was before the committee was largely in regard to the small packages done up in paper that were then done up in an outside wrapper and folded in such a way that the purchaser would not see the stamp.

I believe that claim has been made before this committee and before other committees, possibly, and in different ways; but my experience in that direction has been that possibly a mistake might be made in the rush of a grocery store or something of that sort. A package might possibly get out without being branded; but I believe it is the intention of every dealer in butterine to comply with the United States laws. We have among our trade very little, if any, evasion. We advise all of them that they comply with the law, because the penalty is so severe that a violation of it would practically wipe them out of business. We, in order to facilitate the sale of butterine and help the grocer along in his line of business, are putting out large bill posters. We have probably 500 of them distributed about Chicago. They are about 20 by 10 feet in size, and read: "Ask your grocer for Moxley's high-grade butterine." We are not only complying with the revenue law, but are going beyond them in advertising the product.

Q. Do you know of anything at all that you consider deleterious to public or private health that goes into your goods?—A. There is absolutely nothing that goes into the composition of butterine that is injurious in any way to health that I know of. We are familiar with everything that enters into the composition of it as made in our factory, and can say positively that there is nothing used there that would injure a person in butterine.

The CHAIRMAN. I don't think of anything else. If any gentleman present wants to ask any question this is an open door.

Mr. KNIGHT. If I may be permitted I would like to ask a number of questions, inasmuch as there are a great many points that have not been brought out—that is, if you and Mr. Dadie have no objection.

The WITNESS. I would be pleased to answer any questions you may ask.

Mr. KNIGHT. You put up a little oleo product in 1-pound prints?

Answer. Yes, sir.

Q. And 2-pound prints?—A. Yes, sir.

Q. You put your name on some of them?—A. Yes, sir.

Q. Do you ever put the word "Oleomargarine" on any of those prints?—A. Yes, sir.

Q. Can you produce one that has the word "Oleomargarine" on the print?—A. Yes, sir; I can produce thousands of them. I would be pleased to have you come over to the factory and let us demonstrate something to you that you are not, apparently, aware of.

Mr. KNIGHT. I have seen a great many packages of oleomargarine and I have never seen any that had the word "Oleomargarine"—

The WITNESS. You have probably not looked for that kind.

Mr. KNIGHT. I have looked for everything in the shape of oleomargarine.

Q. Now, in regard to your allegations regarding the retailers of

Chicago. You said that you believed they sell the goods for what it is, and do not avoid the internal-revenue regulations?—A. Yes, sir.

Q. As a matter of fact, haven't you and your firm, within the last month, sent out letters guaranteeing to protect them against evasions of the same kind in the State laws, and haven't you furnished counsel to defend them in the courts in such charges?—A. We have never yet sent out a letter or advised a customer that we would guarantee them in evasions of the Federal laws.

Q. Just the State laws. You are not fighting the Federal laws?—A. No, sir. We advise our customers to comply with all Federal legislation.

Q. But you do fight the State laws? You don't pretend to obey the State laws in any place?—A. We are fighting laws that I believe are put through at the instigation of yourself.

Mr. KNIGHT. I did not pass the laws, only in one State. There are 33 States that have laws which you are fighting.

The WITNESS. And if anyone attempts to persecute our customers we certainly will defend them.

Mr. KNIGHT. I would like to make a record of the following affidavit and complaint [handing same to the chairman]. You may read it, Senator. It was contested here in this city by these gentlemen, by this gentleman's firm, and Brown & Fittz, and by a number of firms where we attempted to prosecute for the sale of oleomargarine without advising the customer of the fact that it was sold as butterine. In the first case it was simply fought on general principles. In the second case there was no defense raised at all as to the fact, but a long-drawn-out controversy was had on the existence of the law in which the oleomargarine manufacturers placed themselves on record as endeavoring to wipe out all laws.

Mr. BRINE. Mr. Knight should be put on oath.

The CHAIRMAN. He is simply tendering some papers.

Mr. KNIGHT. I was under oath when I made that, before a justice of the peace.

The CHAIRMAN. I was going to say that just as soon as I finish—and it will only take me a few moments—if any one of you wants to offer anything that is proper, he may do so, and if any one wants to ask him any questions, anything that we can get in here that is germane to the investigation may be put in.

Q. (Addressing Mr. Knight.) I would like to have it come in now.

Mr. KNIGHT. No; I would like to ask Mr. Dadie a few more questions.

The CHAIRMAN. That is all right, as long as Mr. Dadie doesn't object, the chairman of this committee will not object.

Mr. KNIGHT. Mr. Dadie won't object. I didn't come expecting that this matter was coming up this morning or I should have brought some documents. I want to file some more interesting letters. I filed some last summer, but I have more which I should like to file with the committee.

The CHAIRMAN. If it is anything concerning the matter in hand, they may be filed.

Mr. KNIGHT. It has.

The CHAIRMAN. Then they ought in fairness to have a chance to see them and explain them.

Mr. KNIGHT. I would be very glad to have it explained, indeed.

Mr. PIRRUNG. I would suggest that Mr. Knight furnish the gentlemen here with copies of anything that he furnishes the committee.

The CHAIRMAN. Oh, yes; whatever I do, I want the doors and win-

dows open, and I want all the facts; and if Mr. Knight files any letters here which are signed by any of the people you represent, I want you to have copies of them, and I want to know all about them.

Mr. KNIGHT. I do not presume that it is any business secret, Mr. Dadie—the cost of the materials you use. It is a matter of public knowledge; for instance, the price of oleo oil to-day, which is published in the National Provision. We know what it is, and you know what it is.

The WITNESS. I know about what it is.

Q. You are not at all reluctant to tell the committee what the price of oleo oil is to-day?—A. I am not advised. I could not say positively, just now.

Q. Well, within half a cent.—A. From 9 $\frac{3}{4}$ to 10 $\frac{3}{4}$.

Q. The price of oleo oil is, we will say, 10 cents. You probably can buy it at that. About what is the price of neutral lard?—A. About 8 $\frac{1}{2}$.

Q. I got a quotation from you. I don't think you quote it that high.—A. You got a quotation from us?

Q. Yes.

The WITNESS. The gentleman is making a written statement. We never quote neutral lard.

Q. What do you call it? What is the price of neutral?—A. Eight and one-half cents.

Q. And what is the price of cotton-seed oil?—A. About 5 or 6 cents a pound—6 cents a pound.

Q. Now, I would like to know, as a matter of information, what proportions in your best oleomargarine you use of oleo oil?—A. I would like to ask you now whether you intend to engage in the manufacture of butterine or not. That is one of the secrets of our business.

Q. If that is a secret, that is another thing.

The CHAIRMAN. I said to start with that I didn't want any business secrets.

Mr. KNIGHT. All right.

Q. I will concede that you use the highest priced material in the manufacture of your oleomargarine. I will concede the use of 10-cent oleo oil. That is the highest price. Now, you are asking for your highest priced goods 17 cents, are you not?—A. Yes, sir.

Q. There is an overrun of at least 10 per cent of milk or water or cream, enough to pay for the churning?—A. You are leaving out the butter there.

Q. You wouldn't use an article that was so easy to become rancid would you, as butter, in your fine butterine?—A. We do not use it in the lower grades. We use it in the higher grades.

Q. Do you use any neutral lard at all, or any neutral in your high-grade butterine?—A. Certainly.

Q. That cheapens the product, anyway, somewhat, does it not, if your oleo oil is 10 cents and your neutral lard is 8 cents, and if you use any considerable proportion of it, it must make it cheaper?—A. Certainly.

Q. That brings it down to these fats, to where at least the oleo oil, or the fats that we call butterine fats—they could not cost you over 9 cents a pound, I suppose?

The CHAIRMAN. That has nothing to do with the question as to whether this article is deleterious to public health or whether it is being sold in fraud or outside of the law.

Mr. KNIGHT. My point is this, Senator: A year ago this firm of William J. Moxley & Co., were quoting upon the market a compound

called oleomargarine at $8\frac{1}{2}$ cents a pound wholesale, after a tax of 2 cents a pound had been paid upon it, leaving them a profit. Now, I want to get at what oleomargarine of that kind could be made of.

Q. At that time your oleo oil, as I remember it, was 8 or 9 cents.

The WITNESS. We sold it at a very slight profit.

Mr. KNIGHT. If that is the kind of business men you are—

Mr. PIRRUNG (addressing the witness). I wouldn't answer as to any particular secrets if I were you, Mr. Dadie.

The CHAIRMAN. It could be no part of the case, because that is a part which I think the committee has no jurisdiction over.

Mr. KNIGHT. I wanted to bring out the points.

Mr. GLEESON. I think that has no bearing on the case at all.

Mr. KNIGHT. You talk so much about the wholesomeness of it that I wanted to find out what kind of oleomargarine you could make for $6\frac{1}{2}$ cents a pound.

The WITNESS. You are taking the markets here to-day as against those of a year ago.

Mr. KNIGHT. I want to make this request: These people have made certain statements to the committee about the honesty with which this product is sold in the city of Chicago. I want to submit a list of 225 retail dealers of this city, and let the chairman call any 25 of them and question on the subject right now. They are men who will come in and tell you the truth about it. I will give you a list of 225 of the retailers of Chicago, and you, Mr. Chairman, can select any 25 of them and ask them what they know about the representations of these butter people. I know their agents are going throughout the city advising them to sell it for butter and offering to defend them and pay all fines and expenses if they do it.

Mr. BRINE. May I ask the gentleman a question?

Mr. KNIGHT. I am not on the stand. I am not sworn.

Mr. BRINE. He has made statements there that there is absolutely no truth in at all.

The CHAIRMAN. It has no possible weight with the chairman of this committee.

Mr. KNIGHT. I am simply making a request—asking leave to file certain papers. It is a motion.

The CHAIRMAN. He makes a statement in regard to his side of the case. It is not evidence and is not considered as evidence.

Mr. KNIGHT. The people whom I bring in will swear, all right.

The CHAIRMAN. We have had quite a number of these people, and if I have time I shall not hesitate to call some, but these gentlemen I promised some months ago to give a hearing. I haven't been able to do it until to-day. You have given the other side of the case pretty well, Mr. Knight. Your evidence was clear and explicit, and the packages you brought in have been identified.

Mr. KNIGHT. I meant to go to the same people and get two packages to-day, but I can send any bell boy out and get the same.

The CHAIRMAN. That would be simply multiplying evidence, and there is no necessity for it. It would be simply cumulative. (Addressing Mr. Knight). Do you wish to offer this now?

Mr. KNIGHT. I could not offer that very well until I am on the stand myself and make a few explanations. I would like to do that.

The CHAIRMAN. Very well. Then keep it for the present.

The CHAIRMAN. Mr. Dadie, you heard one of the witnesses state that there were about 80,000,000 pounds of butterine sold each year.

Q. Is that all the amount you recollect?—A. Yes; that is about the amount for the year 1898.

Q. As shown for the year 1898. Do you think of anything else you want to state to this committee?—A. I would like to state this: That I believe the present Federal law is working an injustice to the retail dealer. I think he is overtaxed, and I quite agree with Mr. Pirung when he says that a tax of \$12 a year is sufficient to pay for all the expenses connected with looking after the business. The internal-revenue people have deputies out who make an effort to see that these goods are honestly and fairly sold to the customers, and the tax paid by the butterine interests more than covers the expense of doing that—a great deal more—and I think the tax on the retailers should be reduced.

The CHAIRMAN. Do you think of anything else?

The WITNESS. I think that is all.

Mr. KNIGHT. There is one question I think that is germane to this proposition: I have here a letter head of William J. Moxley, which says: "Agencies, Jersey City, Philadelphia, Detroit, Cincinnati, Indianapolis, Peoria, Louisville, Boston, Washington, D. C., Baltimore, St. Louis, and Richmond, Va." Might I be permitted to ask if they have branches at those cities?

The CHAIRMAN. I don't think that is germane to the inquiry. He can answer if he chooses; but the question is, Is this a proper thing to sell to the people? Is it deleterious to health, or is it sold in fraud? That is the only question. Those matters are entirely outside, and I have had very great difficulty in getting evidence before the committee. These gentlemen have been ready here for a long time. It is my fault that I didn't hear them before. So many people have been hard to get to come and testify as to the manufacture, because many of them have felt it was simply prying into their personal business; and I don't want, in this investigation, to lay any foundation for any witness who is good enough to give me the benefit of his evidence for any prosecutions outside.

Mr. KNIGHT. Surely not. I will tell you why I raised that point. It is because the point has been raised here, and they have gone into it, and have raised the point of the 10-cent tax that was proposed to be put on oleomargarine. That has been raised by themselves. They have opened that up and have endeavored to show you here why there should be no 10-cent tax on oleomargarine, and why it should not be taxed at all. I can show they are selling every pound of their product practically contrary to the laws of the State, and the people show their desire and preference through State legislation. It is the proper way, and they have done it in this State, and these men are fighting it.

The WITNESS. If Mr. Knight will spend an afternoon in our factory, we will enlighten him.

Mr. KNIGHT. I don't need to be enlightened. I can enlighten you on that subject.

Mr. BRINE. Mr. Knight has not been able to convince the courts.

Mr. KNIGHT. You people have not been able to convince the courts very much, either.

The WITNESS. I want to say that the internal-revenue law requires every retail dealer to brand the outside wrapper on his package, when sold, with a stamp on which is his name, his address, the city in which he lives, and the word "Oleomargarine" in letters one-fourth of an inch large, square. That stamp is furnished by William J. Moxley to every one of their customers free of charge.

Mr. KNIGHT. As I understand it, then, Senator, if I may be per-

mitted to interpose here, you want to know nothing at all about anything except the Government regulations.

The CHAIRMAN. No; not at all. Quite the contrary.

Mr. KNIGHT. Then why doesn't it furnish—

The CHAIRMAN. I don't want any witness to be asked any question. Even in this investigation, if there were prosecutions pending against the gentlemen here, I would not permit any question that would even tend to have them violate their constitutional right of incriminating themselves. I would not permit it.

Mr. KNIGHT. I understand the point. You would not want to make a matter of record of anything that might be used in court against them. Under the circumstances, then, we would be barred from asking these questions, I presume.

Mr. PIRRUNG. I am not acquainted with Mr. Knight, and your committee ought to ask him why he takes such an interest in this matter.

The CHAIRMAN. That is extraneous.

Mr. PIRRUNG. He has asked a great many irrelevant questions.

Mr. KNIGHT. I will take the stand at any time you want, and you may ask me any questions you want to.

The CHAIRMAN. I have no doubt it would be highly entertaining.

Mr. KNIGHT. I have nothing to conceal. You can ask me questions all day. I don't care.

STATEMENT OF JOHN F. JELKE.

JOHN F. JELKE, being duly sworn, replied as follows to questions put by the chairman:

Q. What is your name, residence, and occupation?—A. John F. Jelke; residence, Chicago; vice-president and general manager of Brown & Fitts, a corporation manufacturing oleomargarine in Chicago.

Q. How long have you been engaged in that business?—A. I have been in the butter and oleomargarine business altogether twenty-seven years.

Q. Does the firm of which you are general manager deal exclusively in the manufacture of oleomargarine?—A. It deals exclusively in it, and they are the largest churners of butterine in America.

Q. You have heard the statements of these other gentlemen engaged in the manufacture of oleomargarine?—A. I have not heard, excepting the latter part of the statement of Mr. Dadie.

Q. Have you anything to add as to the ingredients which have been testified to?—A. I have not, other than that we make butterine that is so wholesome that I use it on my table and feed it to my two boys—one 12 years old, who weighs 115 pounds, and the other 19 and weighs 141 pounds, and is 6 feet tall. They have used butterine all their lives, practically.

Q. You make that statement simply to show that you consider it perfectly safe and wholesome for children to use?—A. That is the idea.

Q. Do you use any preservative except salt?—A. None whatever. No chemical of any kind is used in our factory.

Q. Where is your factory?—A. On North Union street, 187 to 197, near Grand avenue. I would also say that the men in our factory who make the butterine use it at home in their families. I state that

simply to show that they know that the goods that enter into the product are of a wholesome character.

Q. Have you had any chemical analysis made of your particular brand of goods?—A. Not any of recent years. We have not considered it necessary. There have been analyses made by the butter people.

Q. Have you anything to say as to the charge made of the sale of the small packages of oleomargarine without being properly marked, to give notice to the consumer?—A. Well, so far as our policy is concerned, we believe that the interests of the butterine manufacturers will be best served by having the goods sold for what they are to the consumer and let the consumer know what they are buying. Whether there might be some evasion of the law I couldn't state, of my own knowledge.

Q. You are not a retailer?—A. I am not a retailer and never have been.

Q. You don't know of any general evasions of the law?—A. I know nothing about the evasions of the law, other than as stated by Mr. Knight, who is secretary of the Dairy Union, which is opposed to the manufacture and sale of oleomargarine.

Q. Have you anything further that you want to state for the benefit of the committee, which will represent your side of the case here?—A. Well, our advertising—our general advertising—we have thousands of circulars and pamphlets printed, all showing that the goods are sold for what they are, and when these cards are hung up they advertise butterine or oleomargarine, which is practically the same thing.

Q. There are different grades of oleomargarine?—A. Different grades; yes, sir.

Q. In the higher grades you use some butter?—A. In the higher grades some butter and cream are used.

Q. And in the lower grades some of the other fats?—A. Well, I would say here that we do not make anything of what we might call a low grade. We don't make cheap, shoddy goods of any kind.

Q. What can a low grade be made of?—A. A low grade of butterine—and, by the way, a very large quantity of it is used—a low grade is made by the use of cotton-seed oil. It is a perfectly wholesome oil, but it is a vegetable oil, and we contend it will not carry the butter flavor, and for that reason we do not use it. It is used largely as a filler, and for cheapness. The other manufacturers—all of them, I believe—use more or less cotton-seed oil.

Q. I understand you to say that you people comply with the internal-revenue law at the factory, and, so far as you have any personal information, your customers do in selling?—A. Yes, sir. The tax we pay will show the extent of our business. We are the largest taxpayers of any of the factories in this country. Our taxes for the past year have exceeded \$300,000.

Q. Do you think of anything further that you want to state?—A. Well, as regards the taxes which are charged the retail and wholesale dealer, they were imposed at the instigation and through the efforts of the butter people, who are opposed to our product on account of its economical value, knowing that it is a perfectly wholesome, pure food, that can be produced practically at a less cost than butter. The smallest shop in this town, in order to sell one pound of oleomargarine, is required to pay a license of \$48 per annum, which is larger than the liquor tax for the biggest saloon in Chicago.

Q. That is, larger than the Government tax?—A. Larger than the

Government tax. The people who require a cheap, fatty food are thus debarred from buying it because they can not find it at their shop at which they are accustomed to trade, and it also adds expense to the sale of the product that interferes very largely with its sale. I understand there has been some testimony as to the amount of tax that should be assessed the retail dealer in oleomargarine. The smaller the tax the more general the sale, and the larger will be the revenue that the Government will derive from the sale of oleomargarine; the smaller the dealer's tax, I mean.

The CHAIRMAN (Addressing those assembled). Can anyone else suggest any question?

(There was no response.)

The CHAIRMAN. Mr. Knight, do you wish to ask any questions?

Mr. KNIGHT. They can not answer anything without incriminating themselves. I might ask Mr. Jelke if any of their labels has the word "Oleomargarine" on it any place. That—I mean to say your wrappers.

The WITNESS. I would say we had those printed with the word "Oleomagarine" on, and further that not a single pound of oleomargarine can be sold lawfully by the retail dealer unless the word "Oleomargarine" is on the outside wrapper, in type of a size large enough so that anyone but a blind man can read it.

Mr. KNIGHT. That is all right, but that is not your part of it. I am talking about your parchment wrappers. Do you ever put the word "Oleomargarine" on them?

Answer. We do, and have had it printed on; yes, sir.

Q. What do you do with them?—A. We use them right along, every day, and if you come over there you can see them to-day.

Mr. KNIGHT. I have a sample of yours that I want to introduce here this afternoon, which you sent out, showing your wrappers, and I fail to find the word "Oleomargarine" on that.

The WITNESS. That simply shows the face or surface of the goods. As far as that is concerned, the retailer is required by law to wrap them in another piece of paper showing the word "Oleomargarine."

As Mr. Knight has put a question to me, I would like to put a question to him, and that is: Has he ever run a creamery?

Mr. KNIGHT. I have never run a creamery; no, sir. I have been connected, however, with that business. I have been in a great many and I have studied the matter. I think I know something about the business.

The WITNESS. I would like to ask another question.

Mr. KNIGHT. Certainly.

The WITNESS. And that is: Are the most effective laws that interfere with the sale of the oleomargarine the so-called anticolor laws?

Mr. KNIGHT. The most effective laws?

The WITNESS. Yes.

Mr. KNIGHT. They are the only laws I know of that have ever been any good.

The WITNESS. And the color used is the same as that used in butter, is it not?

Mr. KNIGHT. Just the same; as the same kind of color might be used in making counterfeit money that makes the genuine.

The WITNESS. I see you advertise on the first page of your paper, and have for a long time, Wells-Richardson Company's improved butter color.

Mr. KNIGHT. Yes.

The WITNESS. And you claim in your paper, the Chicago Dairy Produce, that the prize winners at most of the places where butter is exhibited have been users of the Wells-Richardson Company's butter color.

Mr. KNIGHT. Yes; that is right. That is admitted.

The WITNESS. And why is that butter color used in butter?

Mr. KNIGHT. That is used in butter to make a uniform color. There is no necessity of using butter color in general, and if the conventions were held in general there probably would not be any advertisements like this; but the conventions are largely held during the winter.

The WITNESS. You advertise Wells-Richardson Company's butter color in May and June?

Mr. KNIGHT. Yes.

The WITNESS. Is there some white butter made, then?

Mr. KNIGHT. To keep the butter uniform, in case the cows should be of such breed that the butter would be white, they use a color to obtain uniformity.

The WITNESS. It is a fraud to use it, is it?

Mr. KNIGHT. A fraud to use it?

The WITNESS. Yes, sir.

Mr. KNIGHT. It is a fraud to use a thing to make something look like some other article; but I never heard anybody being sorry for buying yellow butter, thinking he had got something that was worthless than he thought he was getting. If you have ever known of an instance of that kind I would like to have you recall it, but I never have heard of it, Mr. Jelke. So far as we are concerned, the dairy-men, in this fight, the question of healthfulness will not be raised. I don't mean to say that your product is healthful, or anything of that kind, because there are a lot of people who do not believe it, and if I were to say it they would raise the deuce with me.

Mr. GLEESON. Do you think that would be an important question?

Mr. KNIGHT. Why, no.

STATEMENT OF W. C. POTTER.

W. C. POTTER, being duly sworn, replied as follows to questions put by the chairman:

Q. What is your name, residence, and occupation?—A. W. C. Potter; Chicago; manager of the butterine department for Swift & Co.

Q. How long have you been engaged in that business?—A. Nine years.

Q. As manager of that department have you charge of the manufacture?—A. I do.

Q. You have heard the statement here as to the ingredients that compose oleomargarine?—A. Yes, sir.

Q. Have you anything to add to what has already been said?—A. No, sir. We use the same materials as have been already mentioned, and we use no preservatives other than salt.

Q. And you use the same coloring matter that they testified to?—A. The same coloring matter as has been previously testified to—the Wells-Richardson color.

Q. Where is your factory?—A. We have two factories, one located at Chicago and one at Kansas City.

Q. Does your management of the butterine department take in both, or do you simply manage that department here?—A. Just as far as Chicago is concerned.

Q. Have you anything which you desire to add that you think of as interesting to the business you represent and that you want this committee to know?—A. In putting up the butterine we pack it not only as shown here, but also in the 1-pound print, as has been mentioned before, and I want to offer in testimony the fact that every wrapper, every printed wrapper, that we put around a print or roll of oleomargarine has the word "Oleomargarine" printed very plainly thereon, and if it is desired we can offer in testimony some of those wrappers. There was a question or a statement made that the manufacturers of butterine—this was not under oath, but it was a statement made—were guaranteeing protection to all dealers who sold butterine as butter, and I want to go on record for our firm as saying that the policy of our house is to create a legitimate demand for butterine and sell the product strictly on its merits, and for what it is, and that we have never sent out any letters of that kind. We have never made any promises of that character, and every influence that we can use we exert to have it sold just exactly for what it is.

Mr. KNIGHT. May I say a word? I want to corroborate what he says. I don't think I made the broad assertion. We have been unable to find in any literature or in any way that Swift & Co. have ever made that guaranty. I want to say that because I don't want to reflect upon that company, which apparently has not entered into that part of it.

The CHAIRMAN. Have you anything further to suggest?

The WITNESS. No; I have not.

(A recess was here taken until 2.30 p. m.)

2.30 P. M.

The committee met pursuant to recess.

Present: As before.

STATEMENT OF CHARLES H. THOMPSON.

CHARLES H. THOMPSON, being duly sworn, replied as follows to questions of the chairman:

Q. What is your name?—A. Charles H. Thompson.

Q. And your business?—A. Manager of the butterine department of the G. H. Hammond Company, of Hammond, Ind.

Q. Where do you manufacture butterine?—A. Hammond, Ind.

Q. Hammond, Ind.?—A. Yes, sir.

Q. Did I understand you to say that you are in the managing department, so that you know how it is made from beginning to end?—A. Yes, sir.

Q. You have heard the statements of the other gentlemen who are in the same business?—A. Yes, sir; I have.

Q. Have you any statement you wish to make in regard to the matter?—A. Yes, sir; I have a statement drawn up that I would like to offer as our evidence.

(Said statement is in the words and figures following, to wit:)

The prejudice against oleomargarine that originally existed in the public mind has been substantially entirely dissipated as the method of production, the ingredients of which it is composed, and the excellence and nutritive character of the product have become known. The only opposition existing at this time may fairly be said to be limited to that part of the agricultural class of our people engaged in the manufacture of butter from cream and milk, and therefore this opposition becomes simply trade rivalry.

It is not infrequent in business methods to decry the product of a competitor, and at times this method of opposition is carried to extreme and extravagant lengths; but no sensible person now believes that oleomargarine, made of proper materials, by persons understanding the science thereof, and under advantageous circumstances, is either a dangerous or unhealthful product. The assertion made in times past that oleomargarine is made of bones, scraps, and refuse generally is no longer accepted when the product comes from the houses of established reputation and approved standing for excellence of product. Indeed, it may fairly be claimed that the great body of the public thoroughly understand and appreciate that most brands of oleomargarine are produced in surroundings of such cleanliness and under such careful supervision that few, if any, dairies and creameries could hope to approach them in that regard. The basic elements of oleomargarine, properly made, must negative the idea of adulteration. The article produced by the G. H. Hammond Company is made from oleo oil, which is simply the oil extracted from the caul fat of the beef; neutral lard, which, as its name implies, is essentially a pure lard; cream, milk, salt, butter, and Wells, Richardson & Co.'s butter color. The precedent for the use of the latter ingredient, which is purely a vegetable compound, is the universal use of it by all farmers producing butter for the market from milk and cream alone, and the use of the butter color named, which has extended over many, many years, is but the adoption of a custom that has received the sanction of universal use and approval.

Taking these ingredients and manufacturing them under the most approved scientific principles (and it may be said that in this country to-day the oleomargarine produced of these ingredients, under favorable circumstances and surroundings, represents the highest development of the art), it is idle to talk of either adulteration or of the use of ingredients either injurious to the public health or in any wise tending to the prejudice of the public happiness. That the public recognizes the superior excellence of the article is demonstrated by the constantly increasing use of it. The oleo oil, extracted from the very organ of the cow through which comes milk in its natural state, is nothing more nor less condensed than the fat or oil found in cow's milk, which is the basis of cow butter.

Neutral lard, a natural food product, can not in the nature of things be an adulteration. Taking these two bases there is added salt and butter, and these combined elements are then churned in milk and cream. It has, of course, been observed that the milk and cream thus used furnishes in large degree a market for the natural product of the dairy farmer, and when all these ingredients are manufactured in surroundings of absolute cleanliness and under a formula that is mathematically accurate, what becomes of the suggestion that oleomargarine is an adulterated food product? In what does the adulteration consist?

It has been suggested that the public demand for this product is increasing daily. It is, of course, recognized by everyone that the manufacture of oleomargarine yields a handsome revenue to the Government, the tax upon this product being no less than 2 cents a pound. No one is deceived as to the character of the article, and no attempt is made to impose on anyone. That it is oleomargarine is announced in letters so plainly and conspicuously put upon the packages that he who runs may read, and yet the demand for the article, when produced by houses of established reputation and approved standing, is

constantly growing and enlarging. What, then, becomes of the suggestion that oleomargarine is an adulterated food product, imposed upon people by the adoption of devious ways and uncertain and improper methods? And this, after all, is the ultimate suggestion of the opposition, such as now exists to oleomargarine. And what does this opposition ask? Practically that a food product which has been known and used in Europe for a great many years, and which has finally, in the face of bitter and ceaseless opposition, forced its way to public appreciation and regard in this country, shall be prohibited, in order that the dairy farmer and the creamery owner may be benefited. The thousands of workmen employed in the manufacture of oleomargarine are to be told to find some other employment. Millions of users of oleomargarine, unable to pay the price demanded for cow butter, must go without a product that has received the sanction and approval of intelligent investigation in order that the farmer may possibly get an enhanced price for his butter, and that the Government shall be deprived of the very handsome revenue that it now receives on the production of oleomargarine.

The G. H. Hammond Company respectfully asks a personal investigation of the ingredients of which it manufactures its oleomargarine, the place in which the same is manufactured and the surroundings thereof, and the care and supervision expended in producing its commodity.

All of which is respectfully submitted.

The WITNESS. I would like to add, in addition to that, that we do not encourage or defend the retail dealer in selling butterine as butter. We have never encouraged it, and will not protect them in that, and will have nothing to do with anything of that sort; and when we put up goods in printed wrappers, the printed wrappers have the word "Oleomargarine" on the wrapper.

Q. You don't use anything in the manufacture of your goods different from that as testified to by the others?—A. No, sir; we do not.

Q. And you use no preservatives except salt?—A. None whatever.

The CHAIRMAN. I don't think of anything further. You have covered in your statement practically everything.

Answer. Yes, sir; I think so.

STATEMENT OF HENRY C. PIRRUNG—Recalled.

HENRY C. PIRRUNG resumed the stand, and further testified as follows:

The CHAIRMAN. You have been sworn?

Answer. Yes, sir.

The question came up this morning about the illegal sale of butterine by retail dealers, and the impression was left here that butterine was mainly or largely sold fictitiously—in other words, for something it was not. Recognizing that I am under oath, I don't know of a single instance where that charge has been made by the consumer himself. On the contrary, it has always been by somebody who is selfishly engaged in the eradication or extermination of the sale and manufacture of oleomargarine. It is brought by someone interested in a political way, anxious for financial gain; but the consumer himself, to my knowledge, has never entered a complaint about the illegitimate sale of oleomargarine.

In regard to the finding of coloring matter in butterine, I also want

to state that in my experience of twelve years I have never found a single instance where there was a chemist who ever brought into the trial of a butterine case the actual coloring matter into court for the purpose of having it viewed by the jury and the court, and presented a quantity as evidence. Never in a single instance has that coloring matter been brought, as extracted from a sample, into court, but usually they satisfy themselves with a trace.

I also read in—I can't recollect the name of the paper—that tuberculosis was prevalent in the dairy herds of Illinois to such an extent that 60 per cent of the cows were affected by it, of the higher grade cows, such as Holsteins and Jerseys, and that this examination emanated from the governor of Illinois against the sworn statements of people who are not interested in oleomargarine, that oleomargarine was absolutely pure and healthful.

I think those are the points I wanted to bring out which were not covered in my testimony of this morning.

Mr. KNIGHT. What was the intention of that point about tuberculosis?

Answer. To show that the milk and milk products directly consumed in their entirety were affected by tuberculous cattle, while butterine was claimed by you and others to be healthful.

Mr. KNIGHT. We do not claim it to be healthful.

The WITNESS. You have asserted it.

Mr. KNIGHT. We do not raise it, or assert it, or admit it. We do not raise the question.

The WITNESS. Do you deny it?

Mr. KNIGHT. We do not take any recognition of it at all.

The WITNESS. We do not deny it.

Mr. BRINE. Is this to go into the record?

The CHAIRMAN. It is not material, and yet in one sense it is. It illustrates the point he makes.

Mr. BRINE. It is all right if it is regarded as a part of the examination. I didn't know whether it was to be considered as an outside remark or not.

The CHAIRMAN. I open the door to have everything go in, but nothing except statements under oath will have any weight with the committee, of course.

Mr. KNIGHT. The only point is that people come in here and get certain things into the record that go unexplained as representing the other side.

Mr. BRINE. You are a part of the commission, are you?

Mr. KNIGHT. I am an outsider, who has the same right that any outsider has in a matter where his interests are affected. What I want to know is why the point of this tuberculosis was raised here. The matter had not been brought in before that I know of, and I wanted to understand the reason of the oleomargarine people raising that point.

The CHAIRMAN. That is a matter of argument.

Mr. KNIGHT. What is it intended to prove?

The CHAIRMAN. I say it is a matter of argument for you on each side. If that is true, you might argue that there might not be so much tuberculosis in the milk as there would be in the fat, and he might argue that there would be more in the milk than there would be in the fat.

Mr. KNIGHT. As he uses the milk and fat, I don't see where he has got the occasion—

The CHAIRMAN. That is for him to take care of.

The WITNESS. I am glad you brought it out. Every beef cow in the yards here in Chicago, or in any packing house prominently known, is inspected under Government and State supervision, and I want to say to you that no dairy cow is inspected in a like manner.

Mr. KNIGHT. I see.

The WITNESS. Exactly.

Mr. KNIGHT. You use milk in oleomargarine, do you not?

The WITNESS. But we pasteurize it.

Mr. KNIGHT. Pasteurization effects nothing in tuberculosis at all.

If you will look up your authorities—

The CHAIRMAN. That is a matter of argument, Mr. Knight.

Mr. KNIGHT. Then, I will ask you—

The WITNESS. Now, wait a minute.

Mr. KNIGHT (continuing). If you claim that pasteurization kills the tubercular germs—

The WITNESS. Now, for the sake of the gentleman's information and for my own, I was led to believe this morning that the information the committee seeks for is such as will have weight regarding oleomargarine before the House of Representatives and the Senate. Is that it?

The CHAIRMAN. Yes.

The WITNESS. And I don't want to go into any trifling argument.

Mr. KNIGHT. You opened it up.

The WITNESS. I made my point. Now I refuse to answer any more questions. [Addressing Mr. Knight.] You are done for, as far as I am concerned.

Mr. KNIGHT. All right. Let that be made a matter of record.

The WITNESS (addressing the stenographer). Did you put that in the record—that he is done for, as far as I am concerned?

Mr. KNIGHT. The only thing is, I don't think it is fair to go down to the House of Representatives with a lot of statements that are not explained.

Mr. DADIE. We do not come here and question your statements.

Mr. KNIGHT. You had the privilege of coming here.

The CHAIRMAN. Is there any other witness present?

STATEMENT OF CHARLES A. STERNE.

CHARLES A. STERNE, being duly sworn, replied as follows to questions put by the chairman:

Q. What is your name?—A. Charles A. Sterne.

Q. Where do you live?—A. Here in Chicago.

Q. What is your business?—A. I am in the general commission business on the board of trade, packing-house products and supplies.

Q. You have heard the statements here as to how these are made?—A. I know how they are made. I have heard the statements made here.

The CHAIRMAN. We have all agreed on what the ingredients are. They have stated the ingredients here, so that there is no question about them. Do you use anything different from what is commonly used in the manufacture of these goods?

Answer. We are not manufacturing ourselves. We are acting as commission merchants in buying for the butterine people.

The CHAIRMAN. Oh, I understand. I don't know of anything spe-

cial, then, Mr. Sterne, that I care to question you about. If you have any statement to make, you may make it.

The WITNESS. I only want to emphasize the strict examination and purity that is required, not only by the manufacturer of the raw material, but by the manufacturer of the finished product, in all materials which go into butterine. Our experience has been quite extensive in that direction. We know just what they require and what it is made of, and how it is made. The simplicity of the manufacture and its uniform cleanliness are a natural consequence. It can not be otherwise.

Mr. PIRRUNG. If the chairman will pardon me. Mr. Sterne came here at my solicitation. It was through his father and through his own knowledge that he has ascertained the difference in the value of cattle prior to the making of butterine and the present time, because it was attempted to be shown here to-day that oleomargarine was a detriment to the farmer or dairyman; that he was even injured by the manufacture of oleomargarine. Now, Mr. Sterne is a broker in all these lines, not only in the butterine lines, but also in kindred products coming from the animal, and we want to attempt to illustrate through him that oleomargarine has advanced and enhanced the value of not only the pig but the beef to such an extent that they are worth a great deal more money than before the commencement of the manufacture of oleomargarine, and instead of being a detriment to the farmer it is a boon.

The WITNESS. By way of comparison, Senator, if you will permit me. A short time ago I wrote to Mr. Alvord, chief of the dairy division, for an estimate or official statistics as to the production of the butter of this country, simply for my own information. He said he had no statistics, positively, but made an approximation of his own, based upon what he considered a reasonable foundation, that the production of the butter of this country was in the neighborhood of 1,500,000,000 pounds, whereas the production of butterine last year was less than 88,000,000 pounds, a little less than 6 per cent of the production of the butter of the country, which shows the small proportion or effect upon the market; while, on the other hand, the effect of the demand for the fats from the cattle and the hogs has so affected the price of them as to affect every State in the Union. There are exceptions, perhaps, in some butter districts that would not feel the good effect of the advance in cattle to the same extent that they would feel the harm upon butter if such would be the case.

The CHAIRMAN. That simply goes to the question as to whether or not one business is injuring another, and I don't think that, under the scope of this investigation, I am called upon to inquire into it. If this business absolutely ruins some other business or absolutely helps some other business, I don't think, under the resolution, I should inquire into it, although it is interesting.

The WITNESS. The good effect seems to me more universal than the bad effect.

The CHAIRMAN. What I was saying was that I am only to inquire what is deleterious to health, what is being sold for what it is not.

The WITNESS. When you come to the question of deleterious substances, England no doubt has as good food laws as any other country, and the largest proportion of these oleo fats and neutral which is manufactured here is sent to the other side, where enormous quantities, perhaps—well, I wouldn't venture to say how much more than this country—enters into consumption over there, and a great pro-

portion of it right in England, and certainly if she recognizes butterine as palatable—

The CHAIRMAN. That is an argument along the same line. That is very well to have in the record, but I don't care to go any further with it. Here in this record the question is raised as to the purity and healthfulness of these goods. That question is not even raised, and if it should be raised the evidence that has already been furnished would be overwhelming that it is a healthy food product; but the question is, Is it being sold for what it is? This gentleman, Mr. Knight, represents the dairy people. He does not raise the question of its being healthful or unhealthful, but if it is raised, the evidence you have already put in shows, the analysis, so far as it has gone, that it is healthy.

Mr. KNIGHT. Inasmuch as that is in the record, I would like to ask a question of him.

The CHAIRMAN. Very well. Ask the question and I will see if I will allow it.

Mr. KNIGHT. I want to ask him if he sets up a claim that the manufacturer of oleomargarine is responsible for the present high price of meats to the people.

The WITNESS. I don't think that has anything to do with the question.

Mr. KNIGHT. If it has raised the price of cattle, it certainly does.

The WITNESS. I think it has made the price of fats much higher, and I think that the price of fats very materially affects the price of beef.

Mr. KNIGHT. In that case you are responsible for my paying 5 or 6 or 10 cents a pound more for beefsteak than I did a while ago.

The WITNESS. What are you paying for chickens?

Mr. KNIGHT. I don't know. We butter people can not afford to eat chicken.

Mr. BRINE. What is the use of taking up time with that?

Mr. KNIGHT. You people are raising the point of your having benefited the poor man.

Mr. PIRRUNG. We are raising the points that the fats that went almost into the refuse barrel—

Mr. KNIGHT. That is it.

Mr. PIRRUNG (continuing). That were worth 4 or 5 cents a pound, are now worth 6 or 8 cents a pound.

The CHAIRMAN. Cotton-seed oil was wasted.

Mr. PIRRUNG. That went into the rivers a few years ago. It is now being used for salads.

Mr. KNIGHT. Olive oil.

The CHAIRMAN (addressing the witness). Have you anything further to say?

The WITNESS. Concerning the sale of oleomargarine for what it is, it seems to me, from all inside information I have—and I am very close to those manufacturers of butterine—is that their earnest efforts are directed in the direction of having the public realize that they are not endeavoring to sell them anything but butterine; to create a demand, if you please, for butterine, and not for butter. It would be an odious comparison to compare it with some of the butter. I know that.

The CHAIRMAN (addressing Mr. Brine). Do you think of any other questions you want to ask him or any other points you want to make?

Mr. BRINE. Nothing, Mr. Chairman.

MR. CAYLOR. At some future time, before this committee, there are certain lines of investigation which this has developed. It certainly is an interesting thing, and the members of both Houses of Congress ought to know where the benefits are to the masses in an article.

THE CHAIRMAN. Yes.

MR. CAYLOR. And the general industry that it helps or keeps out or suppresses. The greatest good to the greatest number is a fundamental principle of our Government. In accordance with that idea we would like to furnish, at a different time, with your consent, statistics showing the ramifications of this business.

THE CHAIRMAN. That will be all right. That will not take much time, and it can be filed with the committee and go in as a part of the record. There will be no objection to that at any time, and the committee will not close its hearings until Congress meets, and perhaps not then.

THE WITNESS. May I ask, Is this investigation particularly directed toward butterine, without any reference to butter? Are you making an investigation with butter as a comparison?

THE CHAIRMAN. Yes; I intend to do so.

THE WITNESS. Then I was going to raise the question as to whether you had made any arrangements, or whether the committee had made any arrangements, to visit any of these washed-butter places?

THE CHAIRMAN. I want to, but I have been waiting to have Senator Harris come with me. I intend to visit those in this city before I go away this time. There are two places, I believe, within easy reach of my hotel.

MR. BRINE. What is that, butter or butterine?

THE WITNESS. Washed butter.

THE CHAIRMAN. I was not speaking about that, but I mean to take it up. I expected to have some names given me, and I want to see whether that is a clean, healthy process, because everybody is interested in the same thing, and Mr. Knight, who represents the dairy-men, of course would be interested in the same thing.

MR. KNIGHT. I recommended it to you and gave you the names of the people. I recommended that you summon them.

THE CHAIRMAN. I said I would, but I forgot it.

MR. KNIGHT. In fact, we brought them up here.

THE CHAIRMAN. That I didn't know.

MR. KNIGHT. Mr. Henshaw was here, and two manufacturers were here, and you were too busy to take it up.

THE CHAIRMAN. Henshaw is a butterine man?

MR. KNIGHT. He has reformed.

THE WITNESS. There is more money in the butter business.

MR. KNIGHT. I have some records here which are quite new in this connection, and I would like to be called and sworn and file these papers; and if any of the gentlemen want to ask anything about it, I have brought some more packages here which have not been opened. My boy got them on his way up here from some of these immaculate people up here that sell butterine for butter.

MR. BRINE. Did you buy them yourself?

MR. KNIGHT. I can summon the boy.

MR. BRINE. Are you offering these to testify as to their correctness, from what the boy bought? How will you offer evidence of what is in there?

MR. KNIGHT. It is in there all right.

Mr. BRINE. How are you describing its contents, if you say you haven't opened it?

Mr. KNIGHT. I leave it to the judgment of the Senator himself.

Mr. BRINE. You are giving testimony that you know what is inside of a thing that you haven't opened.

Mr. KNIGHT. I am asking him to open the packages.

Mr. BRINE. You recede from the position you took a moment ago. I don't see any use in tendering samples if you didn't get them yourself.

Mr. GLEESON. Is it in line with the testimony—

Mr. KNIGHT. It is in line with the other testimony of this morning of how honestly these goods are sold. I will get the boy here that bought them.

Mr. BRINE. I wish to object to the introduction of these samples, on the ground that they have not been identified by the party who offers them.

Mr. KNIGHT. I will bring the boy here who bought them.

Mr. BRINE. You say the boy did the business?

Mr. KNIGHT. I can bring the boy in fifteen minutes.

Mr. BRINE. You have not your boy here?

Mr. KNIGHT. I had him here, but I let him go after waiting twenty minutes for you people to get through—a boy I sent out to buy this butter.

Mr. BRINE. How do you know what you have got there?

Mr. KNIGHT. Let Senator Mason open it and decide what it is, and I will have it analyzed.

Mr. BRINE. Some boy you hold as responsible as this gentleman here?

Mr. KNIGHT. He is just as responsible as some of them; yes, sir.

Mr. BRINE. What has that got to do with it? The introduction of these samples I object to.

The CHAIRMAN. It would have to be identified.

Mr. KNIGHT. If there is any question, I will bring my witnesses. If the Senator will wait, I will send for my witnesses. There is no monkey business about this.

STATEMENT OF C. Y. KNIGHT.

C. Y. KNIGHT, being duly sworn, testified as follows:

I want to offer as evidence here, under oath, as a matter of record, a certain letter sent by our attorney to Messrs. N. Bank & Co., Chicago, Ill., a copy of one of 1,700 letters sent to retail dealers who handled oleomargarine in the year 1898 and 1899, and up to July 1.

The CHAIRMAN. This is signed by Hugh B. Murray, attorney for the Illinois Dairy Union.

Mr. KNIGHT. Yes, sir; I will read it or let the clerk read this letter.

Mr. BRINE. Why not let it go into the files?

Mr. KNIGHT. You ought to hear it. It is good, rich stuff. You gentlemen have had free sway. You have had everything your own way—

The CHAIRMAN. Let us get down to business. This is a letter from the attorney for the Illinois Dairy Union, stating that he has been employed by the union to prosecute violations of the dairy laws, and I will receive it and file it simply to save time, and then let the question be raised hereafter with my associates on the committee whether

or not it is material or pertinent. I think myself it is, if it is the foundation of something that goes to show that there is some defect in the execution of the present law.

Mr. DADIE. Will you permit me a question?

The CHAIRMAN. Yes.

Mr. DADIE. I would like to know who the Illinois Dairy Union is composed of?

The CHAIRMAN. This witness, perhaps, can answer.

The WITNESS. The Illinois Dairy Union—the members who pay the money into the association are largely creamery men.

Mr. BRINE. Creamery men?

Mr. KNIGHT. Yes.

Mr. BRINE. Is it incorporated?

Answer. No, sir; it is not. It is a branch and works as an auxiliary to the National Dairy Union.

Mr. DADIE. How many members has it got?

Mr. KNIGHT. I think there is a membership of about 75, but I don't know that I came here to testify as to what the Dairy Union is.

The CHAIRMAN. Oh, no. You need not answer at all if you don't want to. Let me see what you have to file.

Mr. CAYLOR. We don't want to confuse the witness. We wouldn't do it for the world; but this Dairy Union, is it interested in any other dairy product except butter?

Mr. KNIGHT. No, sir. The Illinois Dairy Union was formed for the purpose of obtaining and enforcing the dairy laws of this State.

Q. Do you enforce the milk laws?—A. No, sir; the milk business, Mr. Caylor, and the butter business are two separate branches, so far as supplies are concerned. Different men are engaged in them. They have their organization, and we have ours for butter, and they have theirs for milk.

Q. The organization you represent has nothing to do with the laws in regard to the adulteration of milk?—A. No, sir.

Q. Just laws in regard to the manufacture and sale of butter. Is that right?—A. We sometimes help them out in their legislation.

Mr. BRINE. Do you do anything with cheese?

Mr. KNIGHT. No, sir; nothing except butter.

The CHAIRMAN. Do you want to file those letters?

Mr. KNIGHT. Yes. There is a letter I want made a part of the record, signed by William J. Moxley and sent out as a reply, as is shown by the tenor of the letter.

Mr. BRINE. These documents, Mr. Chairman, are going to form a part of the record and will assume the shape of authoritative documents.

The CHAIRMAN. Not necessarily so. I say, under the ruling I do not admit them. I simply keep them, to have—

Mr. BRINE. The authenticity of them should be proved before they go into any record. Who knows that this is W. J. Moxley's letter?

Mr. KNIGHT. I do. This is a card signed by Brown & Fitts. I think the original is in the possession of one of the food commissioners, who was here yesterday, but I will make affidavit that I read proof to it, and that that was taken from the original.

Mr. BRINE. How do you know it was sent out by Brown & Fitts?

Mr. KNIGHT. Well, it was signed by them, and it was post-marked—

Question. How do you know it was signed by them?

Mr. KNIGHT. Their name was at the bottom.

Mr. BRINE. Yes; and yours might be at the bottom of a note for \$1,000.

Mr. KNIGHT. Yes; somebody might forge it. If people forge their names—

Mr. BRINE. Is this an identification of these documents?

The WITNESS. This has not been run as a court of law. I have been before the committee—

Mr. BRINE. I am not criticising the court.

The CHAIRMAN. Anything that is offered—anyone who has any interest in it is entitled to see it before it goes in.

Mr. BRINE. Certainly.

Mr. KNIGHT. Surely.

The CHAIRMAN. I don't see—to be perfectly frank with you, Mr. Knight—I don't see what bearing it would have on the question of whether the goods are being sold in violation of the United States law, or whether—

Mr. KNIGHT. United States law?

The CHAIRMAN. Yes.

Mr. KNIGHT. I will tell you, Senator. I understood that this committee was looking around for some method of obtaining or constructing national legislation that would assist the State laws, and looking for violations of the State laws, to see where we needed legislation.

The CHAIRMAN. Suppose you would take up that question. Then I would have to follow it up into the question of whether the State law is constitutional or not, and consider all of the legal aspects of the case. There is no objection to their being on file, where the other members of the committee may see them, and I will not keep out anything that anyone wants to offer. But I say now that I don't see where it is material to show that the food is deleterious to health or is sold in fraud of the public. This is the language of the resolution:

Therefore the committee [describing the committee] are instructed to investigate and report what, if any, foods are sold that are deleterious to public health, and what foods, if any, are adulterated and sold to defraud the consumer.

That is about the language. I can't give the exact language. There is no objection to these papers being filed, and you had better keep them, because in doing up the papers we might lose them. You had better keep them until they are placed on file, when the committee makes its report.

Mr. BRINE. Would it be proper to have a protest put in against the filing of any unidentified papers?

The CHAIRMAN. Oh, certainly.

Mr. BRINE. So that the gentlemen who read this record will know that these are simply papers handed in by Mr. Knight, with the statement that they had been signed by somebody or other.

Mr. KNIGHT. Do they want to deny it? I suppose they don't have to, of course.

The CHAIRMAN. Have you anything else, Mr. Knight?

Mr. KNIGHT. I have one of Brown & Fitts's. I raised the point this morning that the word "oleomargarine" did not appear on any of their papers. I suppose some intelligent gentleman with lots of money has gotten them up for his own benefit, but I fail to find the word "butterine," or "oleomargarine," or anything of that kind on it [handing paper to the chairman].

The CHAIRMAN. Does the law require that they shall be so marked?

Mr. KNIGHT. No; but my claim is, when they are compelled to put the name "Oleomargarine" on them, that they leave every possible

loophole for the retail dealer to commit a fraud on the people—that they go and suggest to him the putting up of oleomargarine in plain wrappers.

Mr. BRINE. Do you contend that this is a breach of the law on their part, to not put the word "Oleomargarine" on the paper?

Mr. KNIGHT. No, sir.

Mr. BRINE. What is the matter with their doing what they want to?

Mr. KNIGHT. I believe it is the opinion of the chairman that we can not cite any law unless it is constitutional—unless its constitutionality is proven.

The CHAIRMAN. Oh, no; you do not understand me. I am letting all your papers go in. I simply expressed the opinion now that I didn't see—now, take that which is an advertisement of their packages. If it is simply to show that their packages are not marked, when the law does not require it, it would not be material in that particular. If you want to offer a bill or an amendment requiring them to mark it on these packages, then this would be material, but there is no law requiring it now.

Mr. KNIGHT. There is, or has been, in our State—yes, there is now, so far as that is concerned, a law in existence regarding every package being marked—every package and the contents, and each package inside.

Mr. BRINE. This is the Federal law?

Mr. KNIGHT. This is the Federal law we are talking about.

The CHAIRMAN. You have offered these, and I will be glad to have them filed.

Mr. KNIGHT. I don't know as, under the circumstances, there is any use in filing them, because we will present them to Congress in due time anyway.

Mr. BRINE. Will you date it?

Mr. KNIGHT. There are different ways of presenting them.

I would like, for the information of the committee—I wasn't expecting to present this certified resolution—but I say, for the information of the committee [handing a document to the chairman], this was the resolution which was passed by thirty-three food commissioners in session here yesterday, without a dissenting vote. They are the people who have to deal with foods.

Mr. BRINE. Is there any objection to hearing it read?

The CHAIRMAN (reading the same). "Resolved, That this association recommend to the Congress of the United States that the internal-revenue tax on oleomargarine be increased from 2 to 10 cents per pound." And Mr. Knight says this was the resolution passed by the Pure Food Convention here yesterday, and he presents it here for the information of this committee, and I accept it as such information.

Mr. BRINE. What is the pure food commission?

Mr. KNIGHT. They are the food commissioners appointed by the governors of the different States. This is a convention of the commissioners.

Mr. BRINE. They did not meet as a commission?

Mr. KNIGHT. They met in convention to consider matters for the good of the various States and the enforcement of the food laws, and this is a resolution which was passed at their convention.

Mr. BRINE. Was that passed unanimously?

Answer. Absolutely not a vote against it.

Mr. BRINE. Fifteen of those commissioners this morning were down

at the stock yards, and seven or eight of them said they would not have voted for that if they had known what they were doing. That ought to go into the record.

The CHAIRMAN. This is hearsay evidence.

Mr. BRINE. My part is hearsay, of course.

Mr. KNIGHT. You are not testifying now.

Mr. BRINE. You were not testifying, were you?

Mr. KNIGHT. Yes; I was.

The CHAIRMAN. Now, is there anything further, gentlemen?

(There being no response, the committee adjourned subject to call of chairman.)

DEAR MR. BRINE: You will remember that Chairman Mason, of the pure food commission, gave me the privilege of putting in evidence a number of opinions in regard to the wholesomeness of butterine. Inclosed find opinions referred to.

No. 1, from G. C. Caldwell, Cornell University.

No. 2, from Prof. W. O. Atwater, Wesleyan University.

No. 3, from Prof. Paul Schweitzer, Missouri State University.

No. 4, from Dr. Adolph Jolles, Vienna.

No. 5, from Prof. George F. Barker, University of Pennsylvania.

No. 6, from Prof. S. W. Johnson, Yale College.

No. 7, from Prof. W. O. Atwater, Government Agricultural Experiment Station.

No. 8, from Dr. Wiley, chemist United States Department of Agriculture.

No. 9, from Dr. Ames, United States Navy.

Yours, truly,

W. E. MILLER.

Mr. GEORGE J. BRINE, Chicago.

WHOLESEOMENESS OF BUTTERINE.

Prof. G. C. Caldwell, of Cornell University, says:

"The process for making butterine, when properly conducted, is cleanly throughout, free from animal tissue or other impurities, and consists of pure fat, made up of the fats commonly known as alaine and margarine. It possesses no qualities whatever that can make it in the least degree unwholesome."

Prof. W. O. Atwater, of Wesleyan University, contributed this to the discussion:

"Butterine is perfectly wholesome and healthy, and has a high and nutritious value. The same entirely favorable opinion I find expressed by the most prominent European authorities—English, French, and German."

INDORSEMENTS.

Prof. Paul Schweitzer, Ph. D., LL. D., professor of chemistry, Missouri State University, February 20, 1895:

"As a result of my examination, made both with the microscope and the delicate chemical tests applicable to such cases, I pronounce your Silver Churn Butterine to be wholly and unequivocally free from any deleterious or in the least objectionable substances. Carefully made physiological experiments reveal no difference whatever in the palatability and digestibility between Silver Churn Butterine and butter."

Dr. Adolph Jolles, of Vienna, from address given before section 7 of the International Hygienic Congress at Budapest, in September, 1894—No. 6:

"As regards nutritive value, pure butterine or oleomargarine is as digestible and nutritive as pure butter.

Prof. George F. Barker, of the University of Pennsylvania:

"Butterine is, in my opinion, quite as valuable as a nutritive agent as butter itself. It is perfectly wholesome, and is desirable as an article of food. I can see no reason why butterine should not be an entirely satisfactory equivalent for ordinary butter, whether considered from the physiological or commercial standpoint."

Prof. S. W. Johnson, director of the Connecticut Agricultural Experiment Station and professor of agricultural chemistry at Yale College, New Haven:

"It is a product that is entirely attractive and wholesome as food, and one that is for all ordinary and culinary purposes the full equivalent of good butter made from cream. I regard the manufacture of oleomargarine as a legitimate and beneficent industry."

Prof. W. O. Atwater, director of the United States Government Agricultural Experiment Station, Washington, D. C.:

"It contains essentially the same ingredients as natural butter from cow's milk. It is perfectly wholesome and healthy and has a high nutritive value."

The superiority of butterine or oleomargarine is championed by the best journals and newspapers in the United States. Our special brands are "Crescent" and "Silver Churn," manufactured especially for table use.

ARMOUR PACKING COMPANY,
Kansas City.

[Chicago Record.]

The manufacturer of butterine merely uses a new way of producing a well-known food product. He does by machinery what the cow does by the laws of nature. By analysis certain ingredients are found in butter, and oleomargarine is made by obtaining them from some other source and combining them in the correct proportions. One of the principal of these is olein, an exceedingly rich oil secreted by the udder of the cow. The discoverer of the new process argued that if olein was found in the milk it would probably occur elsewhere in the animal, and by analysis he learned that the caul-fat, which forms a cushion and blanket for the intestines, was rich in the substance. It was a comparatively simple process to extract the olein and make it the basis of butterine.

[The National Provisioner.]

AN OFFICIAL OPINION—IS OLEOMARGARINE DIGESTIBLE?

WASHINGTON, D. C., July 10.

This question has been a subject of debate ever since the advent of artificial butter, and Dr. Wiley, chemist of the United States Department of Agriculture, was shown a clipping from a contemporary journal devoted to dairy interests in which it was stated that the heat of the body was not sufficient to emulsify oleomargarine, and for this reason it was not digestible as butter and was not wholesome. "There is nothing in this," he said, "as the heat of the body has nothing to do with the digestion of food. As to the unwholesomeness, that the fats used in the composition of oleomargarine are in themselves unwholesome there is no proof whatever."

[Chicago Chronicle.]

PURE OLEOMARGARINE.

Oleomargarine has been found by Jolles and Winkler to be less infected with microbes than ordinary butter. The butter yielded an average of 10,000,000 to 20,000,000 of microbes per gram and a maximum of 47,000,000, but the average in oleomargarine was only 4,000,000 to 6,000,000, and in no case as much as 12,000,000. No microbes of disease were discovered.

[The National Provisioner.]

In regard to the manufacture of oleomargarine and butterine as a legitimate and beneficial industry, Professor Chandler, of Columbia College, New York, says:

"Nothing objectionable exists in the original composition of oleomargarine, nor is anything objectionable added during the process, and the operations are conducted with the utmost cleanliness. The product is palatable and wholesome, and can be made of uniform quality the year round, and is in every respect superior to a large proportion of butter sold in this city, and can be manufactured at a lower cost. I regard it as a most valuable article of food. In this opinion I am supported by the best scientific authority in the country."

[Woonsocket, R. I., Call.]

DR. HILS ON "FOOD."

He says oleomargarine is healthy, and tea and coffee are not.

Dr. Joseph Hils's lecture to the Cercle Nationale Dramatique last night was largely attended, every seat in the society's hall being taken. The doctor talked for two hours. In the first part of the discourse he entered into an analysis of vegetable and fatty foods. The doctor explained the composition of many of the most familiar vegetables, such as potatoes, peas, and beans, besides giving interesting facts about grains and rice. He told of the effect of rice on the Chinese, and the effect of fats and vegetables on the human system in general.

The doctor said that oleomargarine is good. He told his hearers to not be afraid to eat it.

[Kansas City Star.]

SUPERIOR TO BUTTER.

Dr. Ames an ardent advocate of the use of butterine.

Dr. Howard E. Ames, of the United States Navy, who has taken so prominent a part in the various discussions during the convention of the American Public Health Association, is probably one of the most thoroughly informed men on the question of proper and nutritious food in the United States. One of the articles of food to which he has paid particular attention is butterine, which he considers a far superior article of diet to butter.

"The reason it is not a more common article of diet," he explained to a reporter for The Star, "is because of a popular prejudice, founded largely upon imagination and careless statements made by many uninformed persons, and, as a matter of fact, there isn't one in 20,000 who can tell the difference between the two. The nutritious value is fully equal to that of butter; it is much cheaper, and when properly made will remain sweet and fit for consumption much longer.

"There might be some argument against butterine made in small establishments, where the material from which it is made is allowed to accumulate for several days; but in the large establishments, like those in this city, where the material is taken from animals killed the same day, the butterine is more free from impurities than butter. There is more fermentation or putrefactive change in milk than the other materials, and the best butterine is that made with the least milk.

"The manufacture of butterine in properly constructed factories is much more clean, too, than the manufacture of butter, and the factories here, I notice, are nearly perfect in that respect. The matter used for coloring is in no way injurious, and the high temperature to which the materials are subjected perfectly sterilizes them. I have seen butterine and butter put up in cans at the same time, and when opened ten or twelve months later the butterine was sweet, while the butter was rancid and unfit for use.

"The idea is to educate the people up to using it. I have recommended its use for the regular rations in the Army and Navy, and am satisfied that it will prove a better article of food than butter. It should be more generally used and not looked upon as an inferior article and makeshift for butter when it is really superior."

N. B.—Dr. Ames represented the United States Government at the recent convention held in Kansas City by the American Public Health Association.

COMMITTEE ON MANUFACTURES, U. S. SENATE,
IMPERIAL HOTEL, NEW YORK CITY,
Saturday, November 11, 1899.

TESTIMONY OF GALLUS THOMANN.

GALLUS THOMANN sworn and examined:

The CHAIRMAN. Please state your residence and your occupation.

Mr. THOMANN. My office address is 109 and 111 East Fifteenth street in this city. I am the manager of the literary bureau of the United States Brewers' Association and am secretary of that body.

The CHAIRMAN. Have you any profession outside of that?

Mr. THOMANN. None. Or, rather, I might say my profession is that of a literary man.

The CHAIRMAN. You are not a professional chemist?

Mr. THOMANN. I am not. I have no other occupation than as I have stated. I devote my entire time to this work.

The CHAIRMAN. How long have you been secretary of this association?

Mr. THOMANN. I have been secretary of it about a year and a half, but have been manager of the literary bureau for the past eighteen years.

The CHAIRMAN. In the investigation now being conducted by this committee we are operating under a resolution passed by the Senate of the United States, which directs us to report to that body on the question of food adulterations; first, those adulterations that are deleterious to public health, and second, those which are not necessarily deleterious to the public health, but which amount to a fraud upon the consumer. In other words, if I should substitute glucose for honey it might be noninjurious, but it would be a fraud upon the public.

Mr. THOMANN. I understand your position, Mr. Chairman.

The CHAIRMAN. I wish to examine you in a general way, without intending in the slightest degree to pry into anyone's personal or private business. Neither is there any desire on the part of the committee to extract any trade secrets from anyone, nor anything that would even look like interfering with private business. We believe that honest manufacturers will assist us in getting rid of what is to them unfair competition, and at the same time the honest manufacturer will have the same interest in his business that the people will have; that is, that things should be sold for what they are. Have you given the subject of food legislation your attention?

Mr. THOMANN. I have written on the subject very considerably and have spoken on the subject before a number of legislatures before which I have attended to speak for the United States Brewers' Association, not, of course, as to the products of all manufacturers.

I shall confine myself closely to your points of inquiry.

I will state with reference to the first point you made, namely, as to adulterations which are injurious to health, that the United States Brewers' Association (and it is only for them that I shall speak) have placed themselves on record, not once, but on a number of occasions, as utterly opposed to anything of that description and are willing to help in the detection and prosecution of persons guilty of adulterations of food or drink which would tend to injure the health of the consumer.

That position we have taken recently at the food convention in Washington when Dr. Wiley was present. I am sure he will agree with me that we took strong grounds in support of that position. In fact, our position could not be stronger. And Dr. Wiley would also agree with me in saying that our action is absolutely sincere, as is evidenced by everything that we have done for a considerable time back.

Our bill is known in the Senate as the Faulkner bill and in the House of Representatives as the Brosius bill. In tangible evidence of our interest in the movement for pure food we have contributed more, I believe, than any other class of manufacturers to the support of the Pure-Food Congress. We also took action at a convention held in Detroit, Mich., in June following the second Pure-Food Congress, which action consisted of a resolution approving of the resolutions of the Pure-Food Congress and approving of the Brosius pure-food bill or the Faulkner pure-food bill.

I believe a mistake has been made in that bill by defining what should be or should not be deemed bad food. I was opposed to that feature of it, but in spite of that we are supporting the bill because we think it is a movement in the right direction.

What we should depend upon in the event of the enactment of such a bill would be the fairness and thorough familiarity of the officers of the Agricultural Department with the matters in hand. We would depend upon them to establish a proper standard.

As to adulterations which may be, as you said, considered in the nature of perhaps noninjurious adulterations, such as may not affect the health of the consumer, but deteriorate the quality of the goods, I am at liberty to state that the brewers of the United States are also strongly opposed to any such adulterations. The great difficulty, however, lies in the fact that no two individuals among themselves and no two chemists in the country or in the world will agree among themselves as to what would constitute an adulteration in that sense, neither official chemists nor other chemists.

In an argument which I recently submitted to the legislature of the State of New York I submitted an extract from a report of the British parliamentary commission which investigated this subject during four years. The testimony taken by that commission covered two large octavo volumes, or, perhaps more correctly, quarto volumes, of 800 pages. Very important testimony was taken there, and there was a report made to Parliament based on that testimony, which sums up the whole subject. I unfortunately have but one copy of the official report which is based on those volumes of testimony.

Dr. WILEY. I may state that I furnished a very large amount of matter that went into that investigation, statistical and otherwise.

Mr. THOMANN. That commission examined nearly all the brewers in the different parts of the United Kingdom. They examined chemists, not only in the trade, but outside of the trade, and took the testimony of nearly everyone that was considered worthy of being listened to.

As to the definition of beer, the report says:

It can not be admitted that the liquor made from malt, hops, yeast, and water only has an exclusive right to the name beer, or that the purchaser who demands beer demands an all-malt liquor. Sugar was intermittently permitted to be used in beer a century ago; for over fifty years its use has been continuously permitted by acts of Parliament, and eighteen years ago complete freedom in the use of all wholesome materials was deliberately granted to brewers by Parliament.

That was upon the suggestion of Mr. Gladstone, whose utterances upon that subject I have with me.

I will now read from the report of Mr. Gladstone's speech in the House of Parliament:

The brewer [said he] will brew from what he pleases and he will have a perfect choice of his materials and of his methods. I am of opinion that it is of enormous advantage to the community to liberate an industry so large as this with regard to the choice of those materials. The taxes upon the fiscal product we must retain, but when we remember that £50,000,000 is the value of the article produced, I would ask the House whether it is not a great object of policy, whether it is not a great step toward a more perfect fulfillment of those principles of freedom of commerce that we have been endeavoring to maintain for the last forty years, to liberate, as to choice of materials and as to process of manufacture, an industry of so vast a scope as is this particular industry.

That is from a report of a speech delivered by Mr. Gladstone in connection with a report made by an official commission under the authority of an act of Parliament some eighteen years ago—in 1880.

I will continue to read, if the committee will allow me, from the report of the parliamentary committee of 1899 on "Beer materials"—the committee of the English Parliament:

Under the circumstances [the report goes on] it must be presumed to be public knowledge that beer is not always made from malt and hops exclusively, and consequently we are of opinion that a person who demands beer and is supplied with a beer brewed with a proportion of malt substitute is not thereby prejudiced.

Now, Mr. Chairman, malt substitutes as used in this country are not injurious to health. They are either raw grain, as pure as barley, or they are rice, or they are the products of those cereals, sugar among other things.

The point to which I am now coming in this English report appears to be the milk in the cocoanut. Under the head of "Dietetic value" it says:

The question as to the relative merits of different brewing materials can not be unconditionally settled with the data at present available, but the balance of experience and authority inclines to the view that, while an all-malt brewing from a blend of malt made from the best English and foreign barley is still the best for some descriptions of beer (pale bitter ale, for example), yet for other descriptions, which constitute by far the larger proportion of the beer consumed, the medium or lower qualities of British barley malt [and our barley malt is not any better; the average barley malt]—the medium or lower qualities of British barley malt are improved as brewing materials by the addition of a moderate proportion of good brewing sugar, and this is especially the case when the barley from which the malt is made has been imperfectly ripened or harvested under unfavorable conditions.

Now, Mr. Chairman, that is precisely the condition of the brewer. Sometimes the brewer is ridiculed for saying that he can actually make a better product in conjunction with raw grain than with the pure malt, yet that is absolutely true.

The brewer obtains a better beer, a less muddy beer, a clearer beer, and a beer of less alcoholic strength, as a rule. The latter point, of course, does not cut any figure before your committee. But this is actually what the brewer believes, and it is what the British commission found to be the case.

Now, sir, if we had the very best English malt, as the British commission state there, or the very best foreign malt, or the very best American malt, and if we had that malt in sufficient quantity, then for certain descriptions of beer an all-malt beer would be preferable. But you can not get it.

I have requested from the Government officials information on the production of barley in this country, and they have very kindly furnished me with a report showing that a very large quantity of barley

is exported, not to be used for malting or beer purposes, but as food. That, of course, is at a very much lower price than is paid for the barley used for malting purposes, and it is because that barley thus exported is simply unfit for malting.

We know that we can improve our beers by the addition to the barley malt of unmalted cereals. That is the whole secret of the question.

If you ask me whether glucose is unhealthy, I would say—and I have it from a good chemist—that by the modern methods of manufacture the elimination from glucose of every trace of sulphuric acid and of every other injurious substance has become perfectly practicable. Glucose is used in brewing only perhaps to the extent of some 15 per cent of the total saccharine material used. It is used, as I am reliably informed, by candy manufacturers, who do not conceal the practice—or did not conceal it when I interrogated them.

I understand that the medium grade of candy contains from 40 per cent to 60 per cent and the lower grades 75 per cent of glucose, and the very best candies contain as much as is used by the brewer when he does use it.

We are not going to make a great fight for the use of glucose. Our position has been misinterpreted with regard to this, because we have opposed measures of this description before the State legislatures upon the ground that other manufacturers of food use glucose in much greater proportion, three and four times, than we do; and yet we, the brewers, are singled out in these bills. Hence these measures have the aspect of being intended as in a sense punitive measures, applying to that class of manufacturers.

In fact, Mr. Chairman, going perhaps a little beyond the inquiry of the committee, I will say that the New York Sun, which has as part owner one of the leading politicians of this State, had an article which said that the brewers had contributed to the Democratic fund (which was not so) and would be punished by an "adulteration bill."

Then, of course, our dignity as manufacturers had compelled us to act. Had the law enacted a prohibition of glucose in all manufactures, it would be different. We would say in that case, "Let the manufacturers of candy go and fight this matter; we are not going to serve as cat's-paws for the candy manufacturers." But here was an attempt to single out the brewers for this action. That is why we opposed the attempt.

I do not mean to say that all brewers would be with me in not fighting a bill against the general use of glucose, or if a Federal law were passed. But as the matter stands to-day the brewer believes that he is entitled to use whatever material he pleases in the manufacture of beer, provided he is absolutely certain—not merely morally convinced, but scientifically certain—that the material he puts into his beer can under no circumstances injure the health of the community.

If the standard set up by the United States Department of Agriculture, or rather by Dr. Wiley, should be one that excludes glucose, of course the brewers would live up to it and would so far as possible to them prevent others from violating the law in that respect. But we do believe, and I have submitted this report in support of our view, that in conjunction with malted barley unmalted cereals should be permitted, and that the product thus obtained is as pure and good and as much a standard product as one made of malt only. In fact, the likelihood is that the beer made of malt only is apt to be inferior beer unless the barley happens, as this English report

clearly states, to be the very best of American or the best of foreign barley.

When you consider, Mr. Chairman, that we have upward of 35,000,000 barrels of beer, and that probably 56,000,000 bushels of barley is all that we raise, and that one-third of that barley is not malted, it is clear that practically we would have only a malt which would make beer of an inferior quality—not of a quality which the brewer could now have by calling science to his aid; not of a quality which he would get by using malt in conjunction with raw grain.

The CHAIRMAN. Referring to the use of unmalted cereals to take the place of hops and malt, and referring to the use of glucose, one question to which I wish to direct your attention is this: Ought there not to be some way by which the consumer of that product should know to a reasonable certainty how much glucose, for instance, is being used in place of barley or malt, how much of unmalted cereals, etc.? In other words, ought there not to be some standard of beer?

Mr. THOMANN. Certainly; and Dr. Wiley knows that I have advocated that very thing.

In view of the almost perplexing variety of opinion on the subject, I thought—and I offered an amendment to that effect—that if the Agricultural Department, after consulting the men who understood the subject, would establish a standard and could make a standard that would be satisfactory to all and especially to the public, it should do so. But in view of the manifest variety of opinions on the subject, as I have said, the establishment of a standard should be preceded, in my judgment, by a conference on the part of the person or persons whose duty it might be to establish the standard with the persons who are to live under it or up to it.

This, I thought, was a proposition which, in all fairness, could be asked by any class of manufacturers. But you can not by any means determine, for instance, a beer made of two-thirds malt and one-third rice, which is conceded the world over to be superior to malt beer. I suppose in that class of cases some American brewers would be glad to have it known that they make a rice beer.

In Germany they have very fancy gilt signs showing that they make or sell, as the case may be, rice beer. Some American brewers might do the same. Other brewers, knowing the ingrained prejudice of the public mind against anything that is not barley malt, might think that such a statement might injure the producer.

Mr. HERBERT W. HART. The public mind is generally right.

Mr. THOMANN. That is generally true, I will admit. But when the public mind holds that the beer made of malt in conjunction with rice or with corn or with wheat or oats unmalted is not as good as one made of malt only, and if that same public proves by its consumption of the latter beer that it prefers it to the all-malt beer, then its reasoning would not go far with me.

Mr. HART. I can account for that.

Mr. THOMANN. I can account for it also, but in a different way, perhaps, from that of the gentleman. I shall listen to the gentleman very closely and very gladly when he speaks before the committee if he will allow me to finish my observations.

There are in this city brewers who claim that they have made an all-malt beer for twenty or thirty years and have never made anything but an old-fashioned beer. One of them has gone so far as to oppose his colleagues at Albany by stating that they are in favor of this bill, which I have characterized in the beginning of my remarks,

and say that they are in favor of its being enacted. This statement made before the legislature was utilized by them as an advertisement. They published it in every daily paper that is good for anything as an advertising medium in this city. They had placards put up in every public place. They have done this for years; they are old established brewers. Those brewers sell to-day, at the utmost, 60,000 barrels of beer—about as much as they sold twenty years ago.

The fact is that those brewers who have made the very most of their peculiar stand and who have advertised the fact that they have made such beer for the past twenty years are altogether outstripped by the others. New establishments—new breweries—have been established within ten years that have outstripped those others one hundredfold. That, it seems to me, would tend to prove that if the public were as eager for that style of beer as, according to the views expressed, they are supposed to be, the production of those so-called old-fashioned people would exceed the production of three such breweries as they have; but it does not.

I will give Mr. Hart another example of the fallacy of the view that the public mind is always right. Brewers have made attempts, not once, but a hundred times—and he will find that to be the fact if he goes into any establishment—to produce such a beer; and they have also imported it from Munich brewmasters, but the customers would not have it. The customers say, "Sell us the old light effervescent beer," which, as a rule, is of not-malted materials, the difference between the two materials being that barley is really an inferior one to the other cereal, if you use rice or wheat, for barley is certainly not considered superior to rice. The difference is that one is malted and the other not. Dr. Wiley will explain to you why this raw grain is used, because a certain quantity of malt can convert a certain quantity of unmalted matter, and that is all there is of it. So, it is nothing but prejudice, every effort to single out the brewer for using grain that is not malted.

But if a Federal standard should be established, eliminating all these materials, the brewers would be the first to live up to it. The sincerity of their position is not to be doubted. They have, as I say, supported the Faulkner-Brosius bill. They have contributed to the fund to arrange these pure-food congresses, and they have placed themselves by resolution in public conventions in the position of indorsing that measure, so that, as I say, their sincerity can not be questioned.

To sum up, then, I will simply say that as brewers we are opposed to adulteration of any description, particularly to that which injures the public health, and also to that which would be a fraud upon the public. But we do claim the right, as this British report concedes it to the brewer, and as Mr. Gladstone twenty years ago conceded, that the brewer should have the right to the choice of his own materials, provided they are wholesome and not injurious.

The CHAIRMAN. Upon the branch of the question as to the manufacture of beer that may be deleterious to the public health, what, if any, information have you as to the use of any antiseptics or preservatives in beers?

Mr. THOMANN. My general information is to the effect that in all European countries where laws regulate this question the use of certain preservatives is permitted; and I think we ought to have a law defining clearly (and I went to Albany to advocate such a thing when Dr. Carroll was secretary of the board of health) that the brewer should be allowed to use preservatives, and the board of health should determine what they should be.

As to the question whether brewers in this country use preservatives, I have frequently found brewers unwilling to ship beer for long distances because they have been opposed to using preservatives.

I have a case in point that occurred recently that exemplifies this unwillingness. We were asked to ship beer to Paris to be used there next spring. The brewers said, "We can not do that; we can not guarantee that the beer will then be fit for use, as we do not use preservatives."

Whether a brewer here and there does use a preservative I am not in a position to state. That, as a matter of course, would be negative evidence. But I do know that there are brewers who object to using preservatives—not one brewer, but dozens of brewers—stating that they do not use them, and exemplifying the fact, as I have said, by their recent declination to send beer to Europe; they said that beers kept under varying temperatures could not be preserved except by the addition of some preservative, and that they do not use preservatives.

The CHAIRMAN. Is it your information that the pasteurizing process has largely done away with the necessity of using antiseptics or preservatives?

Mr. THOMANN. That is precisely the fact. The chairman shows that he understands this subject.

The CHAIRMAN. That was the statement made by other witnesses who have been before the committee.

Mr. THOMANN. That is precisely the case. I was endeavoring to get to that point.

A beer that is pasteurized is really not a beer, for instance, that you would submit to a jury. I mean that a brewer may be averse to submitting a pasteurized beer to a jury which is to determine the superiority of one beer over another. If you should send to Paris a pasteurized beer for comparison as to superiority and quality with a beer that comes from the wood, you would lose, because naturally the beer does lose something of its finer flavor by the process of pasteurizing. It is generally believed—and I believe it—that a beer drawn freshly from the wood is better than one that has been pasteurized.

The CHAIRMAN. This is the first expression of that character that I have heard. Pasteurizing means putting the beer into bottles and then boiling the bottles, I believe?

Mr. THOMANN. To a certain temperature; yes.

The CHAIRMAN. To destroy any germ life that is in the beer?

Mr. THOMANN. That is right.

The CHAIRMAN. I understand you to say that while that has taken the place of and made unnecessary the use of antiseptics or preservatives to preserve the beer, yet, as matter of fact, the beer deteriorates somewhat by reason of the pasteurizing?

Mr. THOMANN. No; I would not say that; or perhaps I did not express myself clearly enough.

The CHAIRMAN. At any rate, you would not submit it to a jury of experts?

Mr. THOMANN. No.

The CHAIRMAN. Because it lacks something?

Mr. THOMANN. Yes; it lacks something that a beer drawn from the wood would possess. The brewers, as I have said, refused to send beer to Paris to be kept there for a certain length of time, because they do not use preservatives, and because, in competing with brewers

on the spot under such circumstances, they would be at a disadvantage. A beer drawn from the wood is considered better than pasteurized beer. A certain amount of carbonic acid escapes. It is not a bad or a deteriorated beer, but a man would not want to put pasteurized beer in competition with beer drawn from the wood.

The CHAIRMAN. Do you know anything about the use of antiseptics in imported beers?

Mr. THOMANN. I am told that the Bavarian beers that are imported are preserved by some antiseptics. The Bavarian law forbids the use of preservatives in beer to be used at home, but not in beer designed for shipment abroad. I believe—my personal opinion is—that the beer could not be sold here in such an excellent state of freshness if preservatives were not used.

The CHAIRMAN. Have you in your possession or can you send to the committee any literary matter relating to this question? This is only one of a very large number of subjects coming before the committee. We are looking for information as to the importation of food products that are shipped into this country from different European countries the sale of which is prohibited in the country of manufacture. For instance, we have been informed that what is known as "black-jack," which is the dead bean of the coffee, the sale of which is prohibited in Germany, is shipped into this country from Germany by the ton, mixed with coffee. What I would like you to give us, if you have it, is exact information (not that we doubt your word at all, but simply that we may have, if possible, official information) on the subject of the use of preservatives in beer exported from European countries into the United States. We would like, for example, to have, if possible, a copy of the Bavarian law which permits the use of preservatives in their export beer and prohibiting that use in beers made for their home consumption.

Mr. THOMANN. I doubt whether there is a law expressly permitting the use of preservatives, but it is tacitly understood that beer not to be consumed in Bavaria may be provided with a preservative in order to insure its healthy condition at the place of destination beyond seas.

The CHAIRMAN. As to the rule of necessity which requires preservatives to be used for beers that are to be shipped to great distances, would not that same rule of necessity for preservatives apply also to ales and porters?

Mr. THOMANN. Yes.

The CHAIRMAN. And to all malt liquors?

Mr. THOMANN. Yes.

The CHAIRMAN. To all liquors that are the subject of fermentation?

Mr. THOMANN. Yes. You have probably heard of an expression which I shall ask the pardon of the committee for using, as I merely repeat an expression well known to the drinkers of ale. Formerly people spoke of "the Bass stink." Upon opening a bottle of ale it was found that there came from the bottle a peculiar smell. It was the smell of the preservative. Everybody knew that the beer imported in bottles was preserved in that way. If you are not in a very great hurry—

The CHAIRMAN. We are not in so great a hurry as will not admit of our doing our work thoroughly.

Mr. THOMANN. Then I shall endeavor to obtain for you an authentic statement as to whether the Bavarian brewer is permitted to use antiseptics or preservatives in beers to be shipped across seas.

THE CHAIRMAN. I should like to embody the matter in the report that the committee will submit, if I can obtain it in time.

My information is that in Bavaria there is a prohibition against the use there of these acids that are used as preservatives, but that the law is so construed that if the beer is marked for export or is exported under the supervision of the government officials, they either do not have that rule in force at all for such cases, or, if they do, they do not enforce it in practice. So far as this committee is concerned, we do not care whether it is a matter of practice or a matter of law. The question is as to the fact.

MR. THOMANN. I shall write immediately for a copy as soon as I reach my office, and I have no doubt that in less than four weeks I shall have authentic information on the subject. I know that in Germany the manufacturers are allowed to use salicylic acid. I understand that the manufacturers of food are allowed to use that acid.

THE CHAIRMAN. Salicylic acid is the antiseptic usually employed, is it not?

MR. THOMANN. It is. The brewers do not use it. I have heard not one but dozens of brewers say that they would not use preservatives in order to have the beer reach its destination in better condition. They pasteurize it and ship it in that state. The statement I made was in connection with the suggested shipments for the Paris Exposition.

May I appeal to Dr. Wiley on this matter?

THE CHAIRMAN. Certainly.

MR. THOMANN. Have you not, Dr. Wiley, received letters from brewers saying that they could not ship their beers to Paris because they did not and would not use preservatives?

DR. WILEY. Yes. If allowed, I should like to say that I have been appointed to aid in securing the best possible collection of exhibits of American food products in connection with the Paris Exposition, and I have appealed to the brewers to participate in sending there the best practicable exhibits of their products. Almost universally the response from the brewers has been that "We are unwilling to send our beers to be placed on exhibition for perhaps six months, and then to be taken from the shelves and tested by a jury, because we use no preservatives; we only pasteurize our beers, which keeps them only two or three months at the most; and at the time that the beers might be examined by the jury we are unwilling to have them then subjected to a comparison with beers that have not been subjected to changes of temperature and climate."

I may state that the process of pasteurizing beer is resorted to in order to keep the beer long enough for home consumption and at the same time not let it coagulate. Albuminous matters render beer cloudy. The temperature for pasteurizing is 140° only. You can easily hold your hand in water at that temperature. But if deprived of some elements, such as the butyric ferments and the lactic ferments, which are persistent, the beer would be rendered flat and unpalatable. Hence pasteurizing is done at a heat only high enough to kill the yeast ferments, and not the lactic or butyric ferments.

THE CHAIRMAN. In other words, those brewers are unwilling to expose their beers to this long test of varying temperatures simply because they do not use preservatives?

MR. THOMANN. That is the reason, and they have refused to send their beers. They did not want foreign judges to say that American

brewers used preservatives. On one occasion one of our brewers made a test of his pasteurized beer. He sent it across the ocean. It was gone three months; and when it came back, it was found, at the end of two trips, to be still in good condition. But that did not satisfy him that it would be good for six months.

The CHAIRMAN. The motion to which it had been subjected did not prove to be injurious to it, but the change of temperature might be?

Mr. THOMANN. Yes.

Dr. WILEY. I have received permission from Commissioner-General Peck to allow brewers who will exhibit beer in bottles to send samples specially for the judges next summer. We hope the difficulty will be overcome in that way.

The CHAIRMAN. I do not know, Mr. Thomann, that there is anything further which I wish to ask you, but I should like to impress upon you the importance, if not inconvenient, for you, of furnishing us with any information or literary material in your possession or that you can procure which shows the importation into this country, whether permitted by law or by the custom or practice of people in Europe, of preserved food, even if it be a food material outside of your specialty—wines, ales, or porters. The committee desires this information because it is clearly, I think, the intention of the committee to stop people abroad from unloading into this country the vile stuff that will not be allowed to be sold in their own country.

Mr. THOMANN. I shall be glad to give the committee any information that I can obtain regarding the existence either of laws on the subject or the existence of customs or practices, as the chairman has stated. Anything sanctioned by practice or custom would be of the same force as though there were a law on the statute book relating to it and commanding it.

I will hand to the committee, and request that it may be placed in the record in connection with my statement, a letter I have received from the director and editor in chief of *Le Petit Journal du Brasseur*, of Brussels, Belgium.

The CHAIRMAN. It will be incorporated in the minutes.

The letter is as follows:

LE PETIT JOURNAL DU BRASSEUR,
5 Boulevard Clovis, Bruxelles, N.E., March 18, 1899.

GALLUS THOMANN, Esq.,

*Secretary United States Brewers' Association,
109 and 111 East Fifteenth street, New York.*

DEAR SIR: I am in receipt of your favor of the 6th instant.

In Belgium any legitimate materials may be used. Brewers are great users of wheat, rice, and maize, as well as barley malt, and in some districts oats and rye form (and have formed from time immemorial) part of the grist.

Sugars and glucoses are in general use, and the excise laws regarding these materials have just been altered so as to facilitate their preparation and use.

A law voted a few years ago absolutely prohibits the use of all antisepsies, the only "tolerance," as the law terms it, being in favor of sulphurous acid and its compounds. Beer may contain upon analysis 14 milligrams to the liter of SO₂ legally supposed not to be added to the beer, but to be derived from the disinfection of the casks. As a matter of fact, brewers use sulphites largely both in the mash tun and in the carriage casks. Excessive quantities have to be used in the

tun before there is any danger of reaching the 14 milligrams in the beer as sold, as, of course, oxidation and decomposition of the sulphite goes on through all the brewing and fermenting process. Greater care has to be exercised when sulphites are added to the beer in cask, as, although oxidation does even then go on rapidly, there would be a danger in sending out beer freshly overdosed with sulphurous acid. With a little care the brewer can, however, and undoubtedly does, keep well within the limit.

Coal-tar saccharin is forbidden. It was much used up to about three years ago, when its use in beer was declared by the Conseil Supérieur d'Hygiène to be inadmissible. Harmless bitters and tannin may be used as hop substitutes, and so may harmless aromatic herbs or seeds, but the law is fully armed to deal with any brewer who should add any deleterious stuff to his beer; in fact, there is no country in the world where the food and drug acts have been brought up to the point they have in this country. You could get an idea of the endless legislation or rather "arrêtés" based on legislation by consulting Camille Wiliquet's book, costing three or four francs, and which, if of interest to you, I will send on to you.

In France the law seems to be in an uncertain state as regards anti-septics. But the courts have lately condemned brewers who use saccharin and salicylic acid. Sulphites seem to be tolerated, and I believe that to some extent fluorides and creosotes are used. A little of these may also be used in Belgium, as they are difficult to find (especially creosotes), but if detected the brewer would undoubtedly be punished.

In France, as in Belgium, all legitimate materials may be used, and all cereals are used, the preponderance, as elsewhere, being barley malt. The law with regard to hop substitutes is about as in Belgium. Tannin is much used, but probably few bittering materials and some aromates. These even include such things as ginger, cloves, pepper, and so on, but I think only inferior sorts of beer are ever brewed with any proportion of them.

The use of tannin (tannic acid) is easily explained. All brewers, of course, use hops, as in every other country, but people here will not have a very bitter beer. The quantity of hops used varies from 2 to 3 per cent on the weight of the malt, but even the smaller quantity is sufficient in some cases to make the beer too bitter, as the beers are very weak, varying from 1,025 to 1,045 for running beers. Tannic acid is then used, in the hope that it will do for beer what an excess of hops would do without the disadvantage of the bitterness.

I believe, as a matter of fact, that there is only one country in the world where barley malt, water, and hops must, by law, be the only ingredients. That is in Bavaria, and the regulation has never even been able to be applied to any other State of Germany. The stories as to the original reason for voting this legislation and for maintaining it are very varied, and I think there is a good deal of reason for supposing that it is to keep up a monopoly that brewers profess to be so enamored of it.

I shall always be delighted if at any time I can be of use to you, and am, dear sir,

Yours, very faithfully,

G. N. JOHNSON,
Editor Petit Journal du Brasseur.

TESTIMONY OF HERBERT W. HART.

HERBERT W. HART, sworn and examined:

The CHAIRMAN. Please state your residence and occupation.

Mr. HART. I reside in New Jersey; my New York address is 52 Broadway. For over thirty years I have studied dietetics and preventive therapeutics. I am a scientific food specialist.

The CHAIRMAN. Will you be good enough to state to the committee anything within your knowledge or the range of your studies regarding the subjects which it is investigating—concerning adulterations of food products?

Mr. HART. I may state on this subject of brewing and adulteration of beers that I do not altogether agree with the views of the gentleman who last addressed the committee (Mr. Thomann) as to the beneficial property of adulterations. I am opposed to all adulterations for the reason that no two foods should be mixed up together. I maintain that there should be no addition of one preparation containing different constituents to another product containing different constituents, for the reason that the human body requires all the properties that nature intended for the blood and that perfectly constituted blood can not possibly be obtained by imperfect constituents.

The CHAIRMAN. You would not say that the mixing of pure malt and hops with water was an adulteration?

Mr. HART. Malted barley contains properties that are analogous to wheat in its entirety. And the only reason why beer has become so universally used and universally required, especially by workingmen, is that they have been robbed, by something worse than adulteration, of the blood-forming properties that are in the wheat, but that are not in the bread. This arises from the fact that there is a most reprehensible violation of nature's laws by the miller for the purpose of doing what the brewers, as has been stated here, do not want to do, for the purpose of preserving and enabling them to send a product to any part of the world that will keep any number of years and come back as good as ever. You could sink a shipload of flour to the bottom of the sea and get it back as good after twenty years as when it was first milled. This is because as soon as the shipload of flour went to the bottom a mere film of water would make a paste which would protect the flour, and extremely little of it would be affected.

If we are to eat what is good, we must take the good in its entirety and not take the good things out of it merely to enable it to "keep."

The system in vogue is now carried to such an extent in all products that unless some great reform is brought about and the public mind is turned to the subject so that a properly constituted whole-wheat bread is provided for the people, the degeneration of the race will go on and on until human beings will become idiots. The only chance of preventing this possibility is to be found in the number of little things that are introduced as remedies. For instance, beer is one. If you feed any person on wheat bread such as is generally used, that person will crave a glass of beer to supply the coloring matter and the phosphates that he has been deprived of in the bread.

That is the sole reason why beer is a necessity and a greater necessity than whisky or any other liquor. There is no liquor sold so harmless as malted beer—home-brewed beer. I remember my father brewing his own beer, and I remember drinking the wort as it came out of the tap. That would be of the highest purity, the essence

extracted from the malt. But that goes through a process of churning and cooling down and fermenting. Then they draw the ferment off.

The yeast that is drawn from it—the yeast that the wort throws off—is an essential of life itself. It has been proved that a person suffering from consumption may derive immense benefit from eating the yeast plant. That yeast plant may be used for the purpose of raising bread. If you raise wheat-flour bread on yeast, you give a certain amount of body and strength to that bread.

It has been proved that aerated bread made of flour by an unfermented process is so innutritious and so nonsatisfactory to the working classes that to a man they gave it up in England. In that country aerated bread became a great failure. I have said, in this city, that I would rather have the commonest flour made with ferment in the dirtiest slum of New York than the best aerated bread made by the best machine in the world, for the reason that I could live; that that would help to sustain my life.

This flour question has much to do with the beer question, because if the masses of the people, especially in darker New York—in the slums—can be fed on whole-wheat food, the system would become so robust, so strong, and so satisfied that there would be no desire for beer at all. Then there would be the drinking of wine and such luxuries, of course, for the rich; but the wholesale use of beer as at present would be needless.

Mr. THOMANN. You referred a moment ago, Professor Hart, to the time when home brewing—domestic brewing—was in vogue in England.

Mr. HART. Yes.

Mr. THOMANN. Do you recollect that in those days, when your father did his own brewing, he ceased it when the Government taxed his product—do you recollect that he used other products than barley?

Mr. HART. No.

Mr. THOMANN. And you never heard of it?

Mr. HART. No.

Mr. THOMANN. Then I will state for your benefit, and the benefit, perhaps, of the committee, that other products were used.

Mr. HART. That is a part of the process that has come into vogue since.

Mr. THOMANN. No; I beg your pardon. Long before your father and before his grandfather lived, laws were passed in different parts of the European Continent peremptorily forbidding the use of barley for beer, because its production was not sufficient to supply the food demand. In some instances the law prescribed what cereal might be used to the exclusion of barley, because the production of that cereal was not sufficient at a certain time to supply the food demand. And that was done not only on the Continent of Europe, but I can quote from the authorities to show that in the English colonies it was also done.

So that the idea that barley was the standard and that nothing else could be used in the production of beer is entirely fallacious.

Mr. HART. I did not know that.

Mr. THOMANN. In those days the legislators, in a patriarchal way, looked into everything. The lawmakers said what could and what could not be used. It was on the same principle that oats at Augsburg, in Bavaria, could not be used.

Mr. HART. There is no doubt that when there was a deficiency of barley a law might have been passed to forbid its use, just as at one

time in the early part of this century the British Parliament prohibited the use of wheat flour, and within three months afterwards a law was passed prohibiting all bolted flours from being used. Eighty thousand troops were encamped on Salisbury Plains, waiting to move, and for a fortnight the troops were compelled to eat nothing but the whole-wheat bread. At first they protested against it and said they could not eat it, but in a few days they benefited so much by it that a committee was instituted to inquire into the wonderful improvement in the sanitary condition of the men. But all the toothless, scorbutic, consumptive people clamored for the repeal of the law, and they went back to the white bread. The food that I advocate would do much to establish correct conditions of life and bring about many needed reforms. It would, for one thing, put an end to the jingoism that prevails, for jingoism comes from lack of brains, and that in turn is the result of lack of brain-forming food.

The CHAIRMAN. How long have you made this subject of food a study?

Mr. HART. Since the year 1855.

The CHAIRMAN. Are you a chemist?

Mr. HART. I am not a chemist, but I have employed chemists to analyze foods for me.

I can state an important fact, not known to the medical men of this country; indeed, very few men are acquainted with the fact that the bran of wheat that has been sold in Minneapolis, to my knowledge, for fuel, contains the most choice brain-forming matter that human beings can require. Brainless people were selling that material at the rate of \$2.50 a ton, while it was estimated that the druggists in the same city were selling at the rate of \$5,000 a ton a remedy to take the place in the human system of the material which, as I say, was sold as practically worthless—simply for fuel.

This is a subject of the most extreme importance to all, for there depends on the use of this food for the brain not only the important question as to how long we shall live and enjoy life, but the question of even more importance to the human race, as to the offspring that we shall leave behind.

Regarding the matter of beer, I saw the other day a bottle marked "Absolutely malt and hops." Now, if all brewers were to be compelled to put on the bottles just what those bottles contain, it would bring forth a better state of things, and be in every respect more satisfactory to the public. If when people bottled anything for sale they were compelled by law to state what the bottle contained, and what the contents were composed of, it would be infinitely better for the community. The English people compelled their traders, in putting up mixtures in which mustard figured, to label them, not "Mustard," but "Mustard condiments." These misrepresentations on the labels of bottles are resorted to for the purpose of making more money out of the articles thus sold.

Mr. THOMANN. Will the gentleman permit me to quote his own words for a moment, and correct me if I misstate them? But before doing so I should like to make one observation. Shortly after the Franco-Prussian war an eminent chemist, whose name has been mentioned here frequently, Pasteur, wrote a book on Fermentation. In his preface to that work he pointed out that one of the most influential causes of the defeat of the French nation in that war was, in his opinion, the physical superiority of the Germans. He saw in the general use of malt liquors by the Germans a reason for their physical

superiority, and he wrote that book, as he stated in his preface, as a contribution to this question, being anxious that his own countrymen should abstain from the intoxicants to which they were addicted, and use those which the Germans had used and were using.

Mr. THOMANN. Does the gentleman mean to say that the general use of wheat flour as sold to-day tends to degenerate our people?

Mr. HART. I do.

Mr. THOMANN. And you said, I think, that the general use of this kind of bread brings about, naturally, the universal use of malt liquors or beer, because beer supplies the nutritive quality which is lacking in this bread.

Mr. HART. Yes.

Mr. THOMANN. Then you have admitted practically that the brewers of the United States have to be thanked for preventing the degeneracy of the American people?

Mr. HART. I agree with you.

Mr. THOMANN. Well, I assert that the gentleman's premise is defective in one very essential particular, namely, the American people are not at all degenerating. Anthropometric measurements show that our men and women are growing taller, larger, and handsomer; and if that is the case, then, according to the gentleman's own reasoning, the general use of beer has accomplished this excellent result.

Mr. HART. After the Franco-Prussian war I wrote some articles on the subject of the food of the respective armies engaged in that conflict. I stated that the brown bread of Germany was the salvation of Germany and the Germans and that Bismarck and the Emperor Wilhelm partook of that brown bread on the field of battle. German women went through the armies with sandwiches made of brown bread, which they offered to the men and which the Germans ate, but which the French declined, saying: "We do not eat the bread of the barbarians." Now, "the bread of the barbarians" made the "barbarians" the victors over the French. It has been frequently and strongly asserted by the best authorities in England that the brown bread of Germany fought the battles of Germany, because it gave to the Germans the stamina to fight which the Frenchmen did not have.

With reference to the question of malt and hops, they would make pure beer, but glucose goes to make adipose tissue. Now, adipose tissue is a curse, because it gives a man too much weight and handicaps his brain. He may have a good brain, but may know nothing of its best use by reason of the presence of this disorganizing factor.

The CHAIRMAN. You would prevent use of glucose, then, in beer?

Mr. HART. Certainly. It is said that they use it for clearness—to make the beer clear. But we do not want it clear. If you go to a chemist and ask for tincture of iron and tell him that it must be clear, he will tell you that if he is to give it to you "clear" it will not be tincture of iron. Sir George Simpson was knighted by Queen Victoria for extracting this decoction of iron and administering it to her for the first time. She derived great benefit from this iron, because it acts beneficially on the system and gives to the blood an element that it requires. People want an iron tonic frequently. But they do not appear to understand that the proper kind of bread has iron tonic in it in its natural and proper form, yet it is rejected. How would you like a coffee that would be "clear"—that would have no color in it, that you could look through and see through all the way to the bottom of the cup? Would you take the leaf of the tea and remove the fiber from it? The fiber is essential.

There is a matter which relates not to the manufacture of beer but to its use, that I should like to mention. It is this: A very damaging effect is produced by the drinking constantly of beer that is ice cold. If in the middle of summer you have to ice beer in order to cool it, there is no reason why it should be always iced. The effects on the stomach are as if you should eat a piece of ice without needing it. Why should not beer be made and served with some regard to the requirements of the stomach?

However, the brewers know no more of dietetics than the doctors. This question of food reform is the most important reform and to be considered before all others. While the committee is investigating pure food, they could not do a greater service than to examine into the injurious effects of white flour upon the people, and upon the children especially. If you walk through the streets and observe the children going to school, you will observe crooked spines and contracted chests and narrow necks and (too often) idiotic looks, all, in my belief, for want of proper food.

So far as beer is concerned, I am quite sure that anything more than malt and hops is unnecessary; and the only reason why rice and other things are put into beer is merely for adulteration. The brewers can get the malt if they want it, but as long as the brewers can purchase something at half the cost of something else, and can make up something that they can sell for beer, which has no more malt and hops in it than chalk contains malt and hops, they will make and sell it.

The beer made and drank in New York is not of the kind that made the English people or the early Americans; for what you all are depends upon what you were—that is to say, what your ancestors were. Then as to bottling: If beer is bottled, it is only for convenience, and the label should state what it is.

I do not approve of the system of importing beers. I would not import a bottle of English beer or any other product from England at all, although I am an Englishman by birth. Every land should produce its own and live on its own. I do not believe even in the eating of bananas here. Let them be eaten by those who produce them, where they are produced, and where they are intended to be eaten. Every country produces its own food and is suited to its own food.

The CHAIRMAN. You do not mean to say that we derive no benefit from imported fruit?

Mr. HART. What fruit is grown in the United States is quite good enough, and you are better by eating what is grown here.

The CHAIRMAN. Do you mean in our own country?

Mr. HART. Every country has its own.

The CHAIRMAN. Suppose our country gets larger?

Mr. HART. It will grow sufficient for everybody.

I should like to add a few words with reference to the nutrition in bread. I made an experiment to prove beyond all doubt the value of the nutritious properties in the bran. I got an analyst to make an experiment which I consider one of the most important ever made. It is this: He took the bran from the bread that was going to be eaten, put it under a microscope, and found that it presented the appearance of mountains of amber, as if filled with nutritious foods. He took some bran from the excrement after it had passed through the stomach, washed it, mounted it, and placed it under a microscope, and it revealed honeycombed cells, as if you were looking down on the earth cut up with canals—running in all directions, sharp edged,

and presenting the appearance of square cells. This showed that the gastric juice extracts this phosphatic property for the blood. So that if the bran is excluded it is done at the expense of the man's mentality.

I have been known as a worker and writer on this question for forty years; and in all those forty years I have never broken down or been ill or even been known to tire, but have been ready to knock a bull down with the fist.

COMMITTEE ON MANUFACTURES, U. S. SENATE,
IMPERIAL HOTEL, NEW YORK CITY,
Monday, November 13, 1899.

TESTIMONY OF MAX SCHWARZ.

MAX SCHWARZ, sworn and examined:

The CHAIRMAN. Please state your residence and occupation.

Mr. SCHWARZ. I am 36 years of age; my residence is in New York City; my occupation is consulting brewer and director of the United States Brewers' Academy.

The CHAIRMAN. Have you had any special course of training for this particular work in which you are engaged?

Mr. SCHWARZ. Yes.

The CHAIRMAN. State briefly what and where it was.

Mr. SCHWARZ. It was in Germany, at various places; at Erlangen, at Breslau, and at the Polytechnic School of Dresden.

The CHAIRMAN. What are your duties as director of this Brewers' Academy?

Mr. SCHWARZ. The teaching of others.

The CHAIRMAN. In what business?

Mr. SCHWARZ. In brewing. This includes not only the theory and science of brewing, but also the practice of brewing. It includes lectures on brewing and experiments in brewing, which are conducted at the academy.

The CHAIRMAN. Does your work put you in possession of the general practice of brewers in this State and country.

Mr. SCHWARZ. Yes. As consulting brewer I am in constant communication with many heads of breweries and their foremen, and I believe that I am fully informed as to all methods of brewing practiced in this country as well as abroad.

The CHAIRMAN. Have you personally inspected brewing in other countries?

Mr. SCHWARZ. Yes; a number of times, during the period of the last fifteen years.

The CHAIRMAN. One of the interesting subjects before this committee and one as to which we are anxious to get all the facts is the question of the use of preservatives in the manufacture of malt liquors. I would like to have you state to the committee whether or not you know of any preservatives that are being used in the manufacture of beer, ale, or porter in this country?

Mr. SCHWARZ. To my knowledge they use salicylic acid and the compounds of sulphurous acid in moderate quantities for shipping and bottled beers, and I consider their use as being one of necessity, considering that beer is an organic compound very liable to decay.

If proper means are not taken to stop the growth of those organisms which cause decay beer will spoil; it will become sour and therefore unsalable. For these reasons I believe that a moderate amount of preservative should be employed, and when conditions require it I recommend the use of those preservatives.

The CHAIRMAN. Do you recommend the use of preservatives for beer in the wood?

Mr. SCHWARZ. I have stated that preservatives should be used for beer which is shipped and bottled. Thereby I mean beer which is exposed to frequent changes of temperature, and it is immaterial whether this takes place in a wood vessel or any other vessel. I may add that I am also in favor of adding a little preservative to those beers which are exposed to a somewhat higher temperature of about a hundred and forty degrees Fahrenheit in bottles, a process commonly known as steaming or pasteurizing the beer. It is not an uncommon occurrence that such beer also—that is, beer which has been steamed—may become sour on account of the presence of germs of bacteria. In order to stop the development of these organisms it is desirable to make use of a moderate amount of the preservatives named above, which will protect the beer from becoming sour and therefore keep it in sound condition.

The CHAIRMAN. Is it your experience and information that such preservatives are added in the ordinary manufacture of beers, such as is put in barrels and sold here to the consumers—in other words, barrelled beer?

Mr. SCHWARZ. Not for the beer consumed in the city and vicinity where the beer has been brewed, because there is no use of preserving any beer which is consumed shortly after it has been removed from the brewery.

The CHAIRMAN. The pasteurizing process will preserve the beer for how long, in your opinion, if the beer is in all other respects made in a clean, natural, and healthy way—assuming the pasteurizing process to be effected at a temperature such as is usual in New York?

Mr. SCHWARZ. Pasteurized beer should keep for an almost unlimited time provided there are no bacteria or no germs of those organisms present; but as beer is exposed to air during the time it is being filled into bottles, as it is impossible to employ sterilized bottles, as the filling implements, hose, and machinery are always more or less exposed to air, it is a matter of fact that bottled beer will contain more or less germs of bacteria, which may or may not be destroyed by the steaming or pasteurizing process. It is therefore a matter of chance whether the pasteurized beer will keep or not. If there are no bacteria or germs present, or little of them, contained in the beer, the durability of the beer would be good. But if by accident or for any other reason beer contains numerous bacteria, the beer will undergo a fermentation despite the fact that it has been subjected to the pasteurizing process. In such cases it is a good precaution to add a little preservative to the beer.

The CHAIRMAN. You mentioned salicylic acid as a preservative. How is that made?

Mr. SCHWARZ. It is made from coal tar.

The CHAIRMAN. Is it regarded as a healthy preservative—as good for the human stomach?

Mr. SCHWARZ. Yes; it is used in large quantities as a medicine in cases of rheumatism, etc.

The CHAIRMAN. What portion would you recommend or do you recommend for preserving bottled beer?

Mr. SCHWARZ. One-half ounce for every barrel of beer.

The CHAIRMAN. How many gallons are there in a barrel of beer?

Mr. SCHWARZ. Thirty-one gallons. This is a ratio of less than 1 part of salicylic acid for every 10,000 parts of beer.

The CHAIRMAN. One one-hundredth of 1 per cent?

Mr. SCHWARZ. Yes.

The CHAIRMAN. What was the other acid you mentioned?

Mr. SCHWARZ. Sulphurous acid.

The CHAIRMAN. How is that produced?

Mr. SCHWARZ. It is produced by burning sulphur. The sulphur takes up oxygen, and the resulting compound is sulphurous acid. This, combined with other chemicals in various forms, yields such substances as sulphite of sodium, sulphite of potassium, sulphite of lime, and bisulphite of lime, which also have preserving effects.

The CHAIRMAN. That would be considered rather an unhealthy or deleterious substance for the human stomach, would it not?

Mr. SCHWARZ. Not in such small quantities as are present in the beer. It may be of interest to know that almost all English ales contain these sulphites, and considerably more of them than the American beers or ales. The brewers not only use these sulphites to preserve their beer—

The CHAIRMAN. You are speaking of England now?

Mr. SCHWARZ. The brewers in England, yes—but they also employ large quantities of bisulphite of lime and similar substances as a mixture to the water which is employed to prepare the liquor. They add, also, quantities of these sulphites to the mixture of water and salt and other materials for the purpose of keeping the liquors sound, as some say, or to bleach the color of the liquor, as others maintain. I am of opinion that they are all intended to preserve the liquor, beginning with the moment when the same is put into vessels which are exposed to the free access of air and where there exists the possibility that the liquor may become spoiled on account of secondary fermentation, which, however, is retarded or entirely stopped by the employment of these sulphites.

The CHAIRMAN. Dr. Wiley, the chief Government chemist, stated here on Saturday, as also did Mr. Thomann, who is connected with the National Brewers' Association, that our American brewers had been solicited to send samples of their beer to the Paris Exposition next summer, but that the brewers had declined to make the exhibit because they did not wish beer which had been bottled and exposed to such changes of temperature to be submitted to the jury of awards after the beer had been in Paris for some months. It appears that the brewers stated to Dr. Wiley and Mr. Thomann that they could not put their beer there and keep it there without the use of preservatives, and that they would not and did not use preservatives. Now, I understand you to say that it is the custom to use these preservatives.

Mr. SCHWARZ. I did say that these substances are employed, and I do recommend them, but I could not say whether it is the custom or not.

The CHAIRMAN. You would recommend, would you, the use of the preservatives that you have mentioned, salicylic acid and sulphurous acid in small quantities—quantities of, say one one-hundredth of 1 per cent? You would not consider that much at all deleterious to the public health or the health of the person who should drink such beer?

Mr. SCHWARZ. Not at all.

The CHAIRMAN. Are you a physician?

Mr. SCHWARZ. No, sir.

The CHAIRMAN. You are a chemist?

Mr. SCHWARZ. A chemist; yes.

The CHAIRMAN. What is your definition of beer?

Mr. SCHWARZ. I am in favor of adopting the English definition of beer, which reads about in these words: "A saccharine infusion to which some sort of bitter has been added." Of course the word "fermented" should be inserted. It is often quoted merely "a saccharine infusion." It is not only a saccharine infusion, but practically it should be "a fermented saccharine infusion."

The CHAIRMAN. The general understanding of beer has been, has it not, that it should be malt, hops, and water?

Mr. SCHWARZ. I do not say it is so.

The CHAIRMAN. Your idea would be, then, that there may be used in the manufacture things other than malt or hops that are not unhealthy?

Mr. SCHWARZ. I should be in favor of using malt adjuncts. These are substances which may not be properly called substitutes for malt, because some of them do not contain substances that are contained in the malt, and still their use is advisable, in fact preferable to that of malt.

The CHAIRMAN. You would not exclude malt entirely?

Mr. SCHWARZ. No. I should like to continue my answer, if you please.

The CHAIRMAN. Certainly.

Mr. SCHWARZ. For example, rice or corn meal, for instance, contains a large amount of starch, which is a very suitable brewing material, but it does not contain a large amount of nitrogenous matter, which, however, is found in large quantities in the malt.

An excessive amount of nitrogenous matter is objectionable, because the beers produced from such material will show difficulties in the verification and they will as a rule possess poor keeping qualities. Now, in order to improve these conditions, rice or corn meal are substituted for a portion of malt, and thereby a more uniform mixture is obtained, which will be preferable to all malt on account of the absence of too excessive an amount of nitrogenous matter.

As it is impossible to obtain a fermentable liquor from rice, corn, or any of these unmalted cereals without subjecting them first to a process known as the mashing process, whereby the starch is changed into sugar, and as for this mashing process and the change or conversion mentioned large quantities of malt are necessary, it is evident that no beer can be brewed without the employment of malt; and as the American malts do not contain a very large amount of nitrogenous substances in excess of that which is desirable, we need not blend these malts with too much unmalted grain, and as a consequence the amount of substitutes or adjuncts used in the United States of America is rather small. I would say that it does not exceed 20 or 25 per cent of the amount of malt employed.

The CHAIRMAN. Then, in your opinion, the unmalted cereals used as a substitute for malt will not exceed 25 per cent of the amount of malt used?

Mr. SCHWARZ. That is correct, and includes also, in my opinion, the amount of sugars and sirups employed.

The CHAIRMAN. The sugars and sirups employed are what are known as corn sugars, corn sirups, glucose?

Mr. SCHWARZ. There are also cane-sugar sirups and refined sirup; occasionally some honey also.

The CHAIRMAN. What, if any, substitute is used in this country in brewing, within your knowledge and experience, in the place of hops?

Mr. SCHWARZ. None at all.

The CHAIRMAN. You know of nothing that is used as a substitute for hops?

Mr. SCHWARZ. I should say, in connection with this, that when hops are very cheap extracts are prepared from them, and these extracts are stored. Now, as they contain nothing but the constituents of hops, we are not justified in considering them to be substitutes for hops. They are hops, and consequently the employment of hop extracts is perfectly legitimate.

Another substance classified as a hop substitute is the sugar lupuline. This is the meal contained in the hop cone. It is an essential part of hops and no substitute at all.

The CHAIRMAN. How is it prepared?

Mr. SCHWARZ. The hop cones are torn open and by passing the leaves and all other constituents over sieves the meal is collected below the seed and then put up in cans and other suitable receptacles.

The CHAIRMAN. Now, I understand that the only substitute you know of being used for hops is the extract of hop and lupuline, which is also an extract of hop?

Mr. SCHWARZ. Yes.

The CHAIRMAN. Only extracted in another way—it is the meal on the inside of the cone.

Mr. SCHWARZ. Yes, but I stated that I should not call them substitutes.

The CHAIRMAN. I understand. That is a question of construction. The only substitute that you know of, then—I call it a substitute, not in any technical sense nor in the sense of wishing to change your definition—that is used for malt is the unmalted rice, corn, or any other cereal that may be used.

Mr. SCHWARZ. Yes; wheat or any other, and the sugars.

The CHAIRMAN. The sugars you consider a substitute for the cereal and as not having any of the qualities of the hops?

Mr. SCHWARZ. No. In the beer it does not take any of the place of the hop.

The CHAIRMAN. Now, as to coloring matter. Do you know of any coloring matter that is used?

Mr. SCHWARZ. Very little is used outside of the colored malt. Sometimes burnt sugar is used, but that is more for pale beers. Very little of this burnt sugar is used for coloring beer.

The CHAIRMAN. Do you know of any other ingredient that you have not mentioned that goes into the manufacture of beer—any that comes within your knowledge and experience?

Mr. SCHWARZ. I can not mention anything else except perhaps isinglass, which, however, is not entering into combination with beer; it is simply a matter of mechanical filtration which is brought about by the use of isinglass. Nothing of it is dissolved in the beer, and consequently its employment does not change the character of the beer in any way.

The CHAIRMAN. What is its object—to settle or clarify the beer?

Mr. SCHWARZ. To clarify the beer.

The CHAIRMAN. And it settles to the bottom?

Mr. SCHWARZ. Yes, and is removed with the other suspended matter which is collected at the bottom of the barrel.

The CHAIRMAN. When you speak of isinglass, you mean the mineral isinglass?

Mr. SCHWARZ. No; not the mineral isinglass, but fish bladders.

The CHAIRMAN. That is animal matter?

Mr. SCHWARZ. Yes.

The CHAIRMAN. That does not, you think, dissolve or in any way become a part of the beer?

Mr. SCHWARZ. Not at all.

The CHAIRMAN. Let me direct your attention for a moment to beers, ales, and porters manufactured outside of this country. What is your information as to the use of preservatives or antisepsics in that beer—whether used more or less in this country—I mean of that beer that is shipped into this country? I am not inquiring as to the beer made, for instance, in England or other countries and sold there; I refer to what we call imported ales, porters, and beers, and I ask you whether they have more, in your opinion, or less of these preservatives?

Mr. SCHWARZ. From actual test I found that the English ale contained usually more of the sulphites than the American ales contained, and that the amount of salicylic acid contained in lager beer brought to this country was about the same as the quantity used in this country.

The CHAIRMAN. Taking Bavaria as an example, is not the use of preservatives prohibited there—that is, in beers made for the home consumption of those people?

Mr. SCHWARZ. Yes.

The CHAIRMAN. Then, as I understand, the Bavarian beer that is manufactured there—for consumption there—is made without the use of preservatives of any kind?

Mr. SCHWARZ. That is so; but it should be mentioned at the same time that there is no country on earth where there is more complaint about the quality of the beer, or what might be called “kicking” about it, than there is in Bavaria.

In my deposition of to-day I have called attention to the fact that it is impossible to exclude germs of bacteria and, we may say, other fungi. This is also impossible in Bavaria; and as the germs just mentioned exist there the same as in any other part of the world, they will get hold of the beer and multiply therein, causing a change of flavor and taste which can not be stopped, because the brewers are deprived by law of any means to arrest the development of these germs. Consequently, the brewer may, without his own fault or mistake, find that his beer has a little foul odor or sour taste, or both. But he is compelled to put the beer on the market, and the criticism is then made that the beer is poor and bad and the brewer must have used some improper materials for the production of this beer. If he were permitted to employ these preservatives the quality of the beer would be improved and there would be less trouble than actually exists. As a matter of curiosity, I may add that the Bavarian brewers are even forbidden to make use of salicylic acid or similar substances for the purpose of washing the yeast.

The CHAIRMAN. Although they are prohibited from using it there, yet as a matter of fact you have found some, have you not, in the goods that they have shipped to this country—for example, in the Bavarian beer?

Mr. SCHWARZ. I have never taken a sample from an original pack-

age, and I am therefore not in a position to state whether or not the beer, even if labeled Bavarian beer, was actually Bavarian beer.

The CHAIRMAN. You have found these preservatives, however, in English imported ales and porters. Have you ever analyzed any such?

Mr. SCHWARZ. Bottled ales; yes.

The CHAIRMAN. Have you found the preservatives there?

Mr. SCHWARZ. Yes.

The CHAIRMAN. And in larger quantities, you say, than is used here?

Mr. SCHWARZ. Yes.

The CHAIRMAN. The committee would like to have your opinion as to whether there ought to be a national law fixing a standard of beer.

Mr. SCHWARZ. I do not know what is understood by the term standard of beer. In my opinion, there is no such thing as a standard of beer. It would be wrong to create a standard by saying that not more than 70 pounds of material should be used for the production of a barrel of beer, or that the minimum quantity should be 50 or 40 pounds. It would be equally wrong to prescribe to the brewers that the beer to be put on the market should contain not less or not more than a given quantity of alcohol. This would be interfering with the requirements of the public and their tastes and also with the skill of the brewer. If I am not mistaken, it was Mr. Gladstone who, so far back as 1880, told the members of the English Parliament that the brewing industry should not be interfered with in such trifling matters as to dictate to the brewers what they should or should not use so long as they do not use anything but good sound materials which are not deleterious and which produce good sound beer.

The CHAIRMAN. That speech of Mr. Gladstone's was made in explaining a bill in which a proposition was made to fix a standard of beer to contain nothing but malt, hops, and water, and he spoke, if I correctly understand it, in favor of allowing the brewer to use what materials were proper to make beer and not limit him to those particular ingredients, and the English commission reported in that way.

Mr. SCHWARZ. That was my understanding of the matter.

The CHAIRMAN. But you know that there are many grades of beer in this country, do you not?

Mr. SCHWARZ. I do not know what is understood by the word "grades."

The CHAIRMAN. Well, there are some beers, for instance, in this country made of pure malt and hops and water; others are made by substituting for hops this extract of hops that you have mentioned, and some are using another extract. Some brewers use glucose as a substitute for the malt. Some use greater quantities than others. Some have less alcohol and some have more. Some use a second or third grade of barley, and some use the best they can get. Ought there not to be some way fixed by which the consumer may know what he is paying for—the same as, for instance, when you go to buy butter, if they want to sell you oleomargarine it has to be marked "Oleomargarine?" So, if you want to buy flour, and ask for flour, if they give you mixed flour it must be stamped "Mixed flour." The question is, do you not believe there ought to be some standard or some way fixed by the Government, as other governments have done, so that the consumer may know what he is buying and what he is paying for?

Mr. SCHWARZ. It is, in my opinion, impossible to fix a standard, and I wish to call attention to the fact that no other government has cre-

ated a standard or fixed one beyond saying, as in the case of the Government of Bavaria and a few other States in Germany that have adopted the policy, that nothing should enter the combination of beer except malt, hops, and water, and that the fermenting agent should be yeast. But even in those countries there is no standard fixed as to gravity of beer or percentage of alcohol, etc.

The CHAIRMAN. The government inspects there the material that goes in. Does not the government inspect in every country the material that goes into the beer?

Mr. SCHWARZ. No; the government does not inspect, to my knowledge; but in some of the countries the tax on beer is collected on the amount of material used.

The CHAIRMAN. When they do that they limit the amount of beer that may be produced from the material, do they not?

Mr. SCHWARZ. No; they do not do that in any country.

The CHAIRMAN. Have you read what is known as the Brosius bill?

Mr. SCHWARZ. Yes.

The CHAIRMAN. Can you state briefly the terms of that bill in regard to beer?

Mr. SCHWARZ. I do not recollect that it deals specifically with beer. It says "articles of food," etc.

I may conclude my answer as to the standard of beer and define my position as follows:

There should, for the benefit of the people and the brewers of the United States, be appointed a commission, with the same powers as that of the British Parliament, and take testimony for the purpose of answering one question, which is, what materials may be used for the production of a wholesome, palatable beer.

There is no doubt that if the matter is probed to the bottom and every logical argument rightfully considered the moral judgment will be that there is nothing to be said against the employment of cereals and sugars as substitutes and adjuncts for malt. It will be found that the moderate use of preservatives should be rather encouraged than prohibited, and that it should be left to the discretion of the brewer to employ preservatives or not. He would certainly not go to the expense of adding preservatives if he did not see that the quality of the beer was thereby improved, without doing any harm to the consumer.

As to the matter of hops, it will be found that all statements made with regard to the employment of hop substitutes can not be proven, in that no hop substitutes are employed, and that there is no possibility, at the present time at least, of employing any hop substitutes, because there is no substance known which could substitute hops; all are a part of the hop. By which I mean to say that we do not know of any aromatic substance which could substitute the elementary constituents of hops. Nor do we know of any wholesome bitter which could be employed instead of the bitter principle conveyed in hops.

TESTIMONY OF HERBERT WILLIAM WIGAN.

HERBERT WILLIAM WIGAN sworn and examined:

The CHAIRMAN. Please state your residence and occupation.

Mr. WIGAN. I am with the H. Clausen & Son Brewing Company, New York. I am brewing master; address, 309 East Forty-seventh street.

The CHAIRMAN. How long have you held the position of brew master?

Mr. WIGAN. I have been a brewer for eighteen years.

The CHAIRMAN. You began early in life?

Mr. WIGAN. When I was eighteen years old.

The CHAIRMAN. This committee is investigating, under the authority of the Senate of the United States, the question as to what food and drink products are adulterated, and what, if any, adulterants are used that are simply frauds, frauds upon the consumer. We are at present investigating the question of malt liquors, and I desire to ask you a few questions, not with a view of inquiring into any of the secrets of your employers or of your own, but to ascertain, in a proper way, the method of manufacturing the goods that you make. I will therefore ask you a few direct questions. Do you use any preservatives, salicylic acid or other acids, to preserve beer?

Mr. WIGAN. Yes.

The CHAIRMAN. You have heard the evidence of the last witness, Mr. Schwarz?

Mr. WIGAN. Yes.

The CHAIRMAN. Do you agree with him as to the use of those?

Mr. WIGAN. Most thoroughly.

The CHAIRMAN. What percentage do you think you use in, say, a bottle of beer?

Mr. WIGAN. I think the amount that Mr. Schwarz stated is rather larger than I should use myself. I am not acquainted with what other brewers do here. I have only been brewing in the United States for two years. My experience has been in England, Ireland, and Australia.

The CHAIRMAN. You think the quantity should be less than one one-hundredth of one per cent?

Mr. WIGAN. Yes.

The CHAIRMAN. Do you use anything besides salicylic acid?

Mr. WIGAN. We use bisulphite of lime.

The CHAIRMAN. Do you use anything besides hops, malt, and water for the manufacture of beer?

Mr. WIGAN. Yes.

The CHAIRMAN. What, if any, substitutes do you use for hops?

Mr. WIGAN. None.

The CHAIRMAN. And for malt what substitutes?

Mr. WIGAN. Corn or cereals and sugar.

The CHAIRMAN. Do you manufacture this sugar yourself?

Mr. WIGAN. No, sir.

The CHAIRMAN. Is it what is ordinarily known as corn sugar or grape sugar?

Mr. WIGAN. Yes; glucose, or grape sugar. We are brewers of beer and ale. We use grape sugar for ale and a very small percentage of glucose for beer.

The CHAIRMAN. You say a very small percentage. What percentage should you say?

Mr. WIGAN. From 7 to 10 per cent, I will say, in the beer, with perhaps 20 or perhaps 25 per cent of corn as an adjunct to the malt.

The CHAIRMAN. As I understand it, this is an unmalted cereal.

Mr. WIGAN. Yes.

The CHAIRMAN. As a man skilled in your business, as you ought to be with your experience, do you consider that the use of that unmalted cereal, which is used in place of malt, deteriorates or detracts from the value of the beer as a food product?

Mr. WIGAN. On the contrary, it very much improves it.

The CHAIRMAN. Improves it in what way?

Mr. WIGAN. Nowadays the tendency is to have a far lighter beer or ale than in former days, and in order to produce this light and palatable kind of ale undoubtedly the use of 25 per cent, say, of this is necessary—to produce a light, sparkling beer, such as is required by the people.

The CHAIRMAN. It makes a more palatable and more popular beer?

Mr. WIGAN. Yes.

The CHAIRMAN. I suppose you would not say, however, from the standpoint of a dietician, whether it was more excellent as a food product or not?

Mr. WIGAN. I should say it was better.

The CHAIRMAN. When you were brewing in England did you use these same antiseptics?

Mr. WIGAN. Exactly the same and in very much similar quantities to what are used here. I think we used rather more in England. I agree with Professor Schwarz that perhaps more was used in England than here.

The CHAIRMAN. How was it in Ireland?

Mr. WIGAN. There they used more malt. There they used more stout and porter, and in those the color has not so much to do with the matter.

The CHAIRMAN. How was it in Australia?

Mr. WIGAN. Exactly the same substitutes were used and to a larger extent. The hotter the climate, as a rule, the more adjunct was used.

The CHAIRMAN. The more substitute?

Mr. WIGAN. I do not call it a substitute. All these things are starch—the same as malt. The starch is the same, but converted into sugar.

The CHAIRMAN. The warmer the climate the more antiseptic or preservative is used?

Mr. WIGAN. That is the general tendency. Of course the material may be so good and sound as that only the same amount of preservative might be used. That depends on the preservative used.

The CHAIRMAN. You use the pasteurizing process, do you not?

Mr. WIGAN. Yes.

The CHAIRMAN. In other words, you boil the beer after it is bottled and corked?

Mr. WIGAN. Yes.

The CHAIRMAN. Do you heat it up to 140°?

Mr. WIGAN. Up to 140 or 158 or 160, according to the variations of the climate to which it is to be subjected.

The CHAIRMAN. The farther away or the farther south it has to be shipped the more particular you are in sterilizing it?

Mr. WIGAN. Yes.

TESTIMONY OF FREDERICK KRUESLER.

FREDERICK KRUESLER, sworn and examined:

The CHAIRMAN. What is your business?

Mr. KRUESLER. I am a brewmaster.

The CHAIRMAN. By whom are you employed?

Mr. KRUESLER. I am employed at the James Everard Brewery.

The CHAIRMAN. In New York City?

Mr. KRUESLER. In New York City.

The CHAIRMAN. What are your duties as brewmaster?

Mr. KRUESLER. I have to brew lager beer.

The CHAIRMAN. Do you superintend the work?

Mr. KRUESLER. Yes.

The CHAIRMAN. Do you have charge of all the material that goes into the beer?

Mr. KRUESLER. Yes.

The CHAIRMAN. Do you personally see to the brewing, the mixing of the various elements, etc.?

Mr. KRUESLER. Yes.

The CHAIRMAN. Do you use any preservatives or antiseptics?

Mr. KRUESLER. No; we pasteurize it.

The CHAIRMAN. Who buys the material?

Mr. KRUESLER. Mr. Everard.

The CHAIRMAN. Do you personally see it when it comes in?

Mr. KRUESLER. Yes.

The CHAIRMAN. Do you know everything that goes into the beer?

Mr. KRUESLER. Yes.

The CHAIRMAN. Where did you learn the brewing business?

Mr. KRUESLER. In this country.

The CHAIRMAN. How long have you worked at it?

Mr. KRUESLER. About twenty-eight years.

The CHAIRMAN. Did you ever use any acids in the manufacture of beer before you worked for your present employer?

Mr. KRUESLER. I have heard that they were used, but I have never used any.

The CHAIRMAN. No preservatives?

Mr. KRUESLER. Oh, yes; I have heard of preservatives being used.

The CHAIRMAN. Have you ever used any?

Mr. KRUESLER. No; I have never used any.

The CHAIRMAN. To what degree of heat do you subject your bottled beer when you pasteurize it?

Mr. KRUESLER. From 140° to 160°. If it is to go to a very hot climate we pasteurize it again—the same bottle heated twice.

The CHAIRMAN. You take it out of the water and then put it in again, or do you let it cool off?

Mr. KRUESLER. We let it cool off.

The CHAIRMAN. Do you use any substitute for hops?

Mr. KRUESLER. No, sir.

The CHAIRMAN. You do not use anything to preserve hops or hop extracts?

Mr. KRUESLER. No, sir.

The CHAIRMAN. You use the hops and nothing in place of hops?

Mr. KRUESLER. That is right.

The CHAIRMAN. For malt do you use anything?

Mr. KRUESLER. We use rice sometimes to make a pale beer.

The CHAIRMAN. Do you use corn?

Mr. KRUESLER. No, sir.

The CHAIRMAN. You make different kinds of beer, I suppose. Do you make any of just hops, malted water?

Mr. KRUESLER. No, sir; we use a little rice. Our beer is mostly of a light standard, and we use rice with it.

The CHAIRMAN. Do you use any coloring matter at all?

Mr. KRUESLER. No, sir.

The CHAIRMAN. What percentage of rice do you use do you think?

Mr. KRUESLER. Not over 20 per cent.

The CHAIRMAN. Take the question of glucose. You have heard of the use of glucose in beer?

Mr. KRUESLER. Yes.

The CHAIRMAN. Do you use it?

Mr. KRUESLER. No, sir.

The CHAIRMAN. You do not use sugar of any kind?

Mr. KRUESLER. No.

The CHAIRMAN. Nor any preservatives?

Mr. KRUESLER. No, sir.

The CHAIRMAN. Would you favor a law that compelled the brewers of the country to name the ingredients that they use in the manufacture of beer?

Mr. KRUESLER. As a practical brewer, I do not know much about that.

The CHAIRMAN. You would not want to give instructions about other people's business?

Mr. KRUESLER. No, sir.

The CHAIRMAN. You know that as far as you are concerned you do not use glucose nor antiseptics?

Mr. KRUESLER. No.

The CHAIRMAN. The only cereal you use is rice, and about 20 per cent of that when you want to make a light beer?

Mr. KRUESLER. Yes.

The committee adjourned until Tuesday, November 14, 1899, at 10.30 a. m.

COMMITTEE ON MANUFACTURES, U. S. SENATE,
IMPERIAL HOTEL, NEW YORK CITY,
Tuesday, November 14, 1899.

TESTIMONY OF J. CHRISTIAN G. HUPFEL.

J. CHRISTIAN G. HUPFEL, sworn and examined:

The CHAIRMAN. Name your residence and occupation.

Mr. HUPFEL. I reside at 148 East Twenty-seventh street, New York City. I am a brewer by trade.

The CHAIRMAN. How long have you been engaged in the brewery business?

Mr. HUPFEL. About forty-one years.

The CHAIRMAN. Do you brew beer, ale, or porter?

Mr. HUPFEL. Lager beer.

The CHAIRMAN. This committee is investigating, under authority of a resolution of the United States Senate, two propositions in regard to adulterations of food and drink. First, as to adulterations that are deleterious to public health; and second, as to adulterations that are in fraud of the purchaser—that is, adulterations that cheapen the goods and result in selling to the purchaser an article cheaper than that which he thinks he is buying. I desire to ask you some questions, and will state for the benefit of all who are here that I have no disposition to pry into your private affairs or your trade secrets, but ask these questions simply in order to ascertain generally what you are making beer of. We only ask that which you are willing to tell and which

everybody is willing should be known to the public. One of the prejudices against the class of goods which you manufacture is caused by the statement that to a certain extent beer is preserved by some antiseptic which is dangerous to the public health. I will ask you whether you use any preservative or antiseptic in the manufacture of your beer?

Mr. HUPFEL. I do not.

The CHAIRMAN. Where is your brewery?

Mr. HUPFEL. At 229 East Twenty-ninth street, New York City.

The CHAIRMAN. Do you yourself own more than one brewery?

Mr. HUPFEL. No; I do not. One is enough just now.

The CHAIRMAN. Did you ever use in the process of brewing any antiseptics, salicylic acid, or any acids?

Mr. HUPFEL. I guess I used it about ten or twelve years ago—that is, for bottling purposes in the summer time.

The CHAIRMAN. What do you use now instead of that?

Mr. HUPFEL. We just pasteurize the beer. If it is to be consumed within a week or two, we do not use anything at all. If it is to be consumed after some time or to be kept very long, we pasteurize it in bottles.

The CHAIRMAN. When was that pasteurizing process discovered?

Mr. HUPFEL. About fifteen or twenty years ago; fifteen years, anyway.

The CHAIRMAN. You say that since that time you have never used any preservatives?

Mr. HUPFEL. No.

The CHAIRMAN. Of what do you make your beer?

Mr. HUPFEL. Of hops, malt, corn, and plenty of water.

The CHAIRMAN. Do you use any rice?

Mr. HUPFEL. No; we have not used any rice. I have tried it occasionally.

The CHAIRMAN. The corn you use is unmalted, I suppose?

Mr. HUPFEL. Yes; unmalted. It is so-called "hominy." It is a little finer hominy. Hominy is sifted out of the hominy which we get. It is ground finer.

The CHAIRMAN. There are different grades of beer in this country, are there not?

Mr. HUPFEL. In regard to the body, yes. Some beer we brew at 12 per cent "kaiser." The lager-beer brewers run generally on the German scale known as "kaiser" and the particular degree as 10 or 12 per cent kaiser.

The CHAIRMAN. When you say "10 per cent kaiser," what does that signify?

Mr. HUPFEL. The scale will show 10 per cent.

The CHAIRMAN. But what do you mean by "kaiser?"

Mr. HUPFEL. I could not tell you exactly. I can not say what that is. It is the scale that the German brewers all use.

Mr. BROWN. It means 10 per cent of extract.

The CHAIRMAN. That is what is meant by 10 per cent of body?

Mr. HUPFEL. Yes.

The CHAIRMAN. In other words, if I take a certain number of bushels of barley malt and a certain amount of corn and hops, sufficient to ferment, and use with that, say, 50 gallons of water, it will have a higher percentage of kaiser than if I used 100 gallons of water?

Mr. HUPFEL. Yes; of course it would be just double. The hops do not add anything to the extract. It is the extract of malt and the

corn that counts, just as they are weighed by the scale. Hops do not add anything to the body of the beer; at least not perceptibly; it is so small that it does not add anything.

The CHAIRMAN. Do you bottle beer?

Mr. HUPFEL. Yes. I do not do so individually. I have a bottler in the establishment.

The CHAIRMAN. You do not use any antiseptics—salicylic acid, or anything of that kind in your bottled beer?

Mr. HUPFEL. No; nothing at all.

The CHAIRMAN. Let me ask your opinion with reference to the question of having a national law on the subject of beer. What would you think, as a business man and as a brewer, of having some governmental regulation as to a standard of beer?

Mr. HUPFEL. As a brewer I would not object at all to have the Government regulate what should be used in the manufacture of beer which is not detrimental to health; that is, the United States Government; but if the States should do that, it would be a bad thing; because, suppose New York State should pass such a law, Jersey beer would be brought in here, and there would be no way of telling what that beer would be made of, whether of glucose, malt, or whatever else it might be made of. After fermentation you could not say what a beer was made of.

The general opinion of the brewers that belong to our association is that they have no objection to the United States Government passing a law preventing brewers from using anything that is detrimental to health, whether the thing so used is raw or manufactured.

The CHAIRMAN. Do you ever use any extract of hops?

Mr. HUPFEL. No; I have never used it. There is some in the market, but I have not used it.

TESTIMONY OF HENRY J. LIPPE.

HENRY J. LIPPE, sworn and examined.

The CHAIRMAN. What is your business?

Mr. LIPPE. I am president of the Elias Brewing Company.

The CHAIRMAN. Where do you reside?

Mr. LIPPE. At No. 2 Beekman place, New York City.

The CHAIRMAN. Are you a practical brewer?

Mr. LIPPE. I am not, sir. I am a merchant. My business has always been the commercial part of the work of manufacturing beer.

The CHAIRMAN. You have nothing to do with the mixture or the manufacture of the beer itself?

Mr. LIPPE. No, but I am more or less familiar with it.

The CHAIRMAN. You know in a general way what is manufactured in your concern, do you?

Mr. LIPPE. Yes; nothing is used that I do not purchase.

The CHAIRMAN. You see what is purchased and I suppose you audit the accounts as president?

Mr. LIPPE. I do audit the accounts. I audit every bill, and I do all the purchasing myself.

The CHAIRMAN. What do you buy to make beer of?

Mr. LIPPE. Grain, hops; some rice.

The CHAIRMAN. You buy some rice?

Mr. LIPPE. Yes, we have done so off and on. It depends on the market whether we buy rice or hominy.

The CHAIRMAN. Do you buy any substitute for hops?

Mr. LIPPE. No.

The CHAIRMAN. Do you ever use lupuline?

Mr. LIPPE. No; we have not used it.

The CHAIRMAN. That is simply a product of the hop, I understand?

Mr. LIPPE. It is the active principle of the hop. It is extracted in the years when hops are very cheap.

The CHAIRMAN. Do you use any antiseptics?

Mr. LIPPE. None whatever.

The CHAIRMAN. You use nothing to preserve the beer?

Mr. LIPPE. No.

The CHAIRMAN. Any coloring matter?

Mr. LIPPE. Yes.

The CHAIRMAN. Is that coloring matter burnt sugar?

Mr. LIPPE. Either dark malt or sometimes sugar.

The CHAIRMAN. You are a business man and president of a brewing association. Please tell me whether you think you use anything in the manufacture of your goods that is noxious or deleterious to public health.

Mr. LIPPE. We do not.

The CHAIRMAN. Nothing that you would not be willing to take yourself or to have your family take?

Mr. LIPPE. No; we are drinking it ourselves in my family, and certainly we use nothing of the kind.

The CHAIRMAN. You realize the difference, I suppose, between the different grades of beer in this country? For instance, I might use the same amount of barley malt, the same amount of corn, the same amount of hops, and the same quantity of water, yet if I introduce a lower grade of malt and a lower grade of hops and a lower grade of barley I make an inferior grade of beer to the beer that you manufacture. Is not that true?

Mr. LIPPE. Yes.

The CHAIRMAN. That is, the material that goes into the beer has largely to do with it, like the material that goes into bread.

Mr. LIPPE. Certainly. Poor malt can not make good beer.

The CHAIRMAN. And the poorer the malt and barley malt, or whatever you use, the poorer the beer, or the lower standard it is. Would it, in your opinion, change the degree or standard of Kaiser?

Mr. LIPPE. Poor malt certainly would. It would not be beer of that fine quality as if made of a fine quality of material. It would be sound beer, but it would not be as good; it would not be as fine.

The CHAIRMAN. Would you, as a business man and interested in your business, favor a standard to be fixed by the Government—not saying what cereals or materials should be used, but simply prescribing that a certain amount of malt extract should be contained in the beer?

Mr. LIPPE. I think that all good brewers would welcome a law by Congress prohibiting the use of anything else but grain and hops. If Congress would pass such a law, one that could not be evaded, something like the Bavarian law, I think that all good brewers would welcome it. We should be glad to have it and have it applied all over the United States, and have it of such a nature that it could not be evaded. The main thing would be that the law should be such as that everyone should be bound to observe it. If it were carefully drawn and without loopholes, I am sure it would be welcomed by the brewers.

The CHAIRMAN. Honest brewers would observe it?

Mr. LIPPE. Yes.

Mr. HUPFEL. Everyone seems to harp on Bavarian beer. Why is it that Bavaria uses only hops and malt? Because that is how the Government of Bavaria gets its income, its internal revenue. The brewers there are taxed for so many bushels of malt used. That is why they are harping on Bavarian beer—"brewed only from hops and malt." If they did not get their internal revenue from that, they could use anything that they had a mind to. They do not tax the beer at all in Bavaria.

The CHAIRMAN. They tax the material that goes into it?

Mr. HUPFEL. Yes.

The CHAIRMAN. And it is so much malt?

Mr. HUPFEL. Yes.

Mr. LIPPE. The consequence is that nothing else can be used, and the law can not be evaded.

Mr. HUPFEL. In Austria they can use anything. The inspector comes around—

The CHAIRMAN. You say that in Austria they can use anything. You mean by that that they can use anything in that country, as they can in England, except that they can not, as I understand it, in Austria use antiseptics or preservatives.

Mr. HUPFEL. I do not know anything about that.

The CHAIRMAN. And also in Bavaria. I understand that there they can not use antiseptics.

Mr. HUPFEL. I so understand.

The CHAIRMAN. But as for beer that is intended for export, they can use antiseptics—that is, there is no regulation as to what Bavarians may do with the beer that is intended to be exported to other countries—as, for instance, if it is to be sent to us here.

Mr. HUPFEL. So I understand.

The CHAIRMAN. That is the information I have. You certainly would agree with me that the proposition is a sound one that we ought to prohibit the importation of all food articles—and we should remember that beer is one of those articles—the sale of which is prohibited in their own country.

Mr. HUPFEL. That is so.

The CHAIRMAN. You would favor that as a business man, would you?

Mr. HUPFEL. Certainly.

The CHAIRMAN. For instance, take the case of coffee. The Germans are not allowed to sell as coffee a black, sour bean which is called coffee.

Mr. HUPFEL. I do not think that there is any article in the United States sold or made that is so pure as lager beer. I think it is the least adulterated of any article made.

The CHAIRMAN. Look at the paper which I now show you, which is entitled "Chemical combinations of standard beers." I am informed by Dr. O'Sullivan that it is the German standard. You spoke of the German standard, I think. Please see if you recognize that as the German standard. I understand that this table is based on a long series of experiments conducted by Prof. Gustav Rupp, and has been adopted by the German Government. It purports to state the different proportions of different chemical elements beer should contain. Of course, I do not ask that your answer shall be exactly accurate, but you can state what your understanding is with reference to the matter. You

may let any of your friends here who understand the subject and who may become witnesses examine it if they wish.

The paper shown to Mr. Hupfel is as follows:

Chemical combinations of 100 cubic centimeters of standard beers.

	Specific gravity.	Water.	Carbonic acid.	Alcohol	Extract.	Albumen.	Sugar.	Dextrin.	Glycerin.	Lactic acid.	Mineral substances.	Phosphoric acid.
Lager	1.0162	90.08	0.196	3.93	5.79	0.71	0.88	3.73	0.165	0.151	0.228	0.077
Export beer.....	1.0176	89.01	.209	4.40	6.38	.74	1.20	2.47	.154	.161	.247	.074
Bock beer	1.0213	87.87	.234	4.69	7.21	.73	1.81	3.97	.176	.165	.263	.089
Ale	1.0140	88.00	.200	5.00	6.40	.54	.95	1.70	.250	.260	.300	.160
Porter.....	1.0200	88.10	.190	4.90	9.60	.60	2.40	2.80	.240	.250	.340	.085
Condensed beer	1.0657	55.80	-----	19.72	24.25	1.30	11.82	7.48	-----	.210	.350	.160

Composition of beer ash.

[Calculated for 100 cubic centimeters of beer.]

Potassium.....	33.67
Sodium	8.94
Calcium	2.78
Magnesium.....	6.24
Ferric oxide.....	.48
Phosphoric acid	31.35
Chlorides.....	2.93
Sulphuric acid.....	3.47
Fluoric acid.....	9.29

Mr. HUPFEL (after looking at the paper). My opinion is that that is about the average as they will run.

The CHAIRMAN. That is the German standard, as near as your memory serves you?

Mr. HUPFEL. Yes; but different brewers differ. Take this city, for instance. As to the chemical part of the process, there are not any two brewers that agree. There are not any two that have the same extracts as they are pointed out in this paper.

The CHAIRMAN. And even two brews from the same brewery differ somewhat as to the extracts?

Mr. HUPFEL. Yes. It is just like coffee. In one house you get altogether a different flavor from what you do in another.

Mr. BROUN. There is also a difference produced by time. A beer 30 days old has more extract than a beer 3 months old.

Mr. HUPFEL. And one brewer will mash a little differently from another brewer. He will take a little longer in the heats. So no two brewers get the same identical results all the way through.

The CHAIRMAN. But there is a standard below which it ought not to go?

Mr. HEMPHILL. I do not see that there is any detriment in saying how low a standard shall go in an extract, because the other ingredients will be in proportion. People who get one beer may get a lighter-body beer than another. They will get more water and less extract. I do not think water will hurt anybody.

The CHAIRMAN. You do not think you ought to sell water for beer, however?

Mr. HUPFEL. Oh, no.

The CHAIRMAN. In other words, there ought to be prescribed at least a minimum amount of malt extract in all the beer you sell, should there not, in order to be perfectly fair with your customers?

Mr. HUPFEL. Yes; that is so, of course.

The CHAIRMAN (to Mr. Hupfel). I am glad you interposed these remarks that you have made, as I am anxious that the committee shall have all the information possible. [Addressing Mr. Lippe.] I think you stated that you used no substitutes for hops in the manufacture of your beer?

Mr. LIPPE. I did.

The CHAIRMAN. And you do not use antiseptics in bottled beer?

Mr. LIPPE. Not necessarily. We only sell to men who have the facilities for pasteurizing the beer. That makes the use of antiseptics entirely unnecessary and simply foolish. In the case of people who have no means of keeping beer, who have no proper facilities, we do not sell to them. We have for years refused to sell to bottlers and do not bottle ourselves.

The CHAIRMAN. If, however, you were going to send beer abroad, to England, Germany, or Bavaria, would you feel that the pasteurizing process would be sufficient to keep it for six months?

Mr. LIPPE. It will keep it indefinitely under our conditions. You can send it to the Tropics and bring it back in good condition.

Mr. HUPFEL. In bottles?

Mr. LIPPE. In bottles. Pasteurizing only applies to bottled goods, and antiseptics are used only for bottled goods.

The CHAIRMAN. It has been stated before this committee that antiseptics are used considerably in imported beer—beers imported in the wood.

Mr. LIPPE. I have not the slightest doubt of it.

The CHAIRMAN. They can not pasteurize it in wood, can they?

Mr. LIPPE. No.

The CHAIRMAN. And it has got to be preserved in some way?

Mr. LIPPE. Yes.

The CHAIRMAN. In other words, if you were going to send your beer away in the keg or barrel—say, to send it around the world, to hot climates, and bring it back—you would be obliged to use some preservative, would you?

Mr. LIPPE. No; we have never used any.

The CHAIRMAN. Then why would it be necessary for the importers of foreign goods—foreign beers—to preserve their beers by these antiseptics?

Mr. LIPPE. I can only answer you in this way, Mr. Chairman: If a foreign house should apply to us for goods in bulk, I would make it plain to them that unless those goods were subjected to a very low temperature they would not keep. If you put such goods on board these great big steamers having facilities for keeping such things, you can keep the beers as long as you please; but if on other vessels, it would be altogether different; unless you have the facilities for maintaining a low temperature, the cask would not be able to hold the beer.

Mr. HUPFEL. You mean lager beer?

Mr. LIPPE. Lager beer, of course. I do not know anything about ale. We do not make ale. You could not keep the beer from fermentation except under a low temperature, and if the facilities on the vessels are such, it can be transported.

The CHAIRMAN. But no one has gone to the expense of pasteurizing that beer in the wood?

Mr. LIPPE. It could not be done.

Mr. HUPFEL. It has been tried.

The CHAIRMAN. The pasteurizing process means that you heat the beer up to 140° Fahrenheit?

Mr. LIPPE. Yes; or to 146, or in that neighborhood.

The CHAIRMAN. Then, that being the case, the only way you could pasteurize beer in wood would be to put your barrels into a vat and boil them.

Mr. LIPPE. Unless it were left too long in the vat I do not think it could be done. The heat would have to be very great to penetrate 2 inches of wood and the large bulk of the contents. I do not think it could be done.

The CHAIRMAN. Then it is your opinion that imported beers, not being pasteurized, must be preserved in some way in order that they may be shipped here?

Mr. LIPPE. I believe that they contain some antiseptics.

The CHAIRMAN. Our Government officials, under the direction of this committee, are analyzing a number of these articles now, and we shall know what percentage they contain before we make our report, I hope. I think I have nothing further to ask you, Mr. Lippe, unless you wish to make some statement?

Mr. LIPPE. There is nothing that I wish to say further.

TESTIMONY OF JOHN W. BROWN.

JOHN W. BROWN, sworn and examined.

The CHAIRMAN. What is your business?

Mr. BROWN. I am president of the "Long Island Brewery." The concern is a corporation, but it was organized under the laws as they existed before the word "company" was required to be added to the title.

The CHAIRMAN. Are you a practical brewer?

Mr. BROWN. Yes, sir. I have not done any actual brewing myself for some years, but I formerly did the brewing in our firm, or corporation.

The CHAIRMAN. What connection do you have with the business now?

Mr. BROWN. I am president of the company now.

The CHAIRMAN. Do you give any personal attention to the business itself?

Mr. BROWN. I give all my time and attention to it.

The CHAIRMAN. You are in the establishment a good deal of the time?

Mr. BROWN. Yes.

The CHAIRMAN. Then you have general knowledge as to the materials that are used in the manufacture of beer.

Mr. BROWN. General knowledge; yes.

The CHAIRMAN. Then you know what you buy to make your beer of?

Mr. BROWN. Yes.

The CHAIRMAN. What do you make the beer of?

Mr. BROWN. We make our beer of hops, malt, grits, sometimes grape sugar—

The CHAIRMAN. Grape sugar? That is, glucose?

Mr. BROWN. No, sir. There is a difference between grape sugar and glucose. One is a liquid and the other is a solid.

The CHAIRMAN. That is used to reduce the amount of malt that you use?

Mr. BROWN. Yes.

The CHAIRMAN. When you use grape sugar, so-called, do you also use corn?

Mr. BROWN. Yes.

The CHAIRMAN. In the same brew?

Mr. BROWN. The same brew.

The CHAIRMAN. Do you use any preservatives?

Mr. Brown. Only in the case of export beer or beer for very long shipment.

The CHAIRMAN. Then what is used?

Mr. BROWN. Well, we have experimented with salicylic acid, but we have not been very well satisfied with it.

The CHAIRMAN. For your ordinary consumption in and about New York, do you use any preservatives?

Mr. BROWN. No, sir.

The CHAIRMAN. Do you use preservatives at all in your barreled beer?

Mr. BROWN. No.

The CHAIRMAN. But you would feel, if it were going on a long shipment in a barrel, to be subjected to changing temperatures, that there ought to be some preservative?

Mr. BROWN. Yes.

The CHAIRMAN. To keep the beer from fermenting?

Mr. BROWN. I doubt whether it would keep under changing conditions without something of that kind; that is, I doubt whether it would keep in a condition in which people would want to drink it. It might still be beer, but it might not be very palatable beer.

The CHAIRMAN. You have had no experience, I suppose, Mr. Brown, in brewing in the old country?

Mr. BROWN. No, sir; I only know of that from what I have read, and that is only as to England.

The CHAIRMAN. Is there a difference, so far as you know, between the manner of separating the yeast ferment in that country and the manner in which it is dealt with in this country? Do they handle it there any way differently from the way in which it is handled here?

Mr. BROWN. Do you mean the addition of the yeast to the sweet water before it is fermented?

The CHAIRMAN. As I understand, there comes a time when, at the fomentation or fermentation of the yeast, it is proper to insert it then, and not proper at any other time. Is there an established difference between the manner of brewing in that respect in this country and in any other country, so far as you know?

Mr. BROWN. I would have to answer that in this way: That so far as the making of ale is concerned in this country and in England I know of no difference in the time of adding the yeast, and can not conceive of any difference existing. As to the time they add the yeast to lager beer in Germany, of that I am not informed.

Mr. HUPFEL. It is the same here as it is in Europe, and in Europe the same as here.

Mr. BROWN. The process is to separate one healthy yeast cell from all other yeast cells, and put that one cell into a solution that will

enable it to reproduce itself—the sugar solution, or a solution containing some sugar and some malt extract. That cell multiplies, and that is added to another and still another until you get enough from that one isolated cultured cell to make a whole brewing of beer.

The CHAIRMAN. What I want to get at is this: It has been stated to the committee, though I do not know that it is in the record, that that is a matter requiring skill and care, and when that skill and care are used there is no need of preservatives, but when it is not carefully used preservatives are absolutely necessary.

Mr. BROWN. I do not view it in that light. You may start out with one yeast cell and get a crop from which you start your fermentation. Those fermenting vessels are open and exposed to the air. Any bacteria or germs that may be floating in the air will fall into the open vat, and all the care you may have taken in selecting that particular cell is nullified.

The only way that the difficulty could be avoided would be to do it to the exclusion of the air—that is to say, in a vacuum—which Professor Pasteur tried some years ago, for which he built a brewery in which beer was not to come in contact with the air at all.

Pasteur started with one cultured cell and added that to one which had been mashed and boiled to the exclusion of the air. In that way he made what he called a perfect beer, but it was so perfect that no one would drink it. Beers vary in taste by reason of those very bacteria that come into it. For instance, one location may be noted for a beer, and there is a certain bacteria in that location that pervades all beers made in that locality, and the public or people of that neighborhood like that taste or flavor of beer, and some other people like it. So that I can not understand where we would be benefited or how by producing a beer from one yeast cell to commence with.

The CHAIRMAN. Inasmuch as it must be done in the open air?

Mr. BROWN. Yes; and if it is not done in the open air, you get a beer devoid of character and practically insipid.

Mr. HUPFEL. The so-called vacuum beer?

Mr. BROWN. Well, to some extent, perhaps. The vacuum beer would be a very pure beer.

The CHAIRMAN. But it would be a beer for angels and not for men?

Mr. BROWN. Yes.

Mr. LIPPE. I can give you an incident from our experience of last year. We applied last year to a friend in Munich, Bavaria, to get the Bavarian Government to let us have some of their cultured yeast. We obtained from the Bavarian Government brewery 100 pounds of their pure cultured yeast. We used that; we propagated it and used it exclusively. We found as a result that the difference was so imperceptible that it was not worth the trouble.

The yeast was not one particle better than the yeast we were using before. The result of the fermentation was nothing better. It changed the taste of the beer and that was all, and that was not worth any trouble except to a man very well accustomed to it. There was nothing whatever gained.

The main thing in the handling of yeast is absolute cleanliness and its not coming in contact with deleterious matter. We have had that experience through six months, with the result that I have stated. We thought that perhaps in Bavaria they had something better than we have here, but there was nothing in it.

Mr. BROWN. I may add that we did the same thing. And the yeast in our lager beer department to-day is the product of the yeast that

we imported from Germany last winter, but there is no perceptible difference in the beer. We have fallen back into our local conditions; that is, subject to the bacteria that prevail in this neighborhood.

The CHAIRMAN. I think it is clearly in the record now that no matter how it is brewed it must be preserved in some way, either by anti-septic or by pasteurizing.

Mr. BROWN. Unless it is meant for immediate consumption.

The CHAIRMAN (handing paper to witness). I now show you a paper which I have shown to a witness who preceded you—a paper entitled "Chemical combinations of standard beers," and I ask you whether that is, according to your recollection, the standard of the German Government. I understand that it is a standard fixed by or through the experiments of Professor Rupp.

Mr. BROWN (after examining the paper). This appears to me to relate to a finished beer, after fermentation. And the beer would vary. For instance, after this beer was finished, after it came out of the fermenting vats, it would naturally have rather more extract than it would at a time later on, because beer never stands still. It is always fermenting. There is a silent fermentation going on that is converting the sugar into alcohol, and I should judge from the very small percentages of sugar noted in this list that it was a beer that was old and had been thoroughly fermented out, leaving very little sugar and rather a large proportion of alcohol. I see here that one of them runs as low as 0.88 per cent of sugar, and it has 3.93 per cent of alcohol.

The CHAIRMAN. Practically 4 per cent?

Mr. BROWN. Yes; while the sugar is only 0.88 per cent, showing that it has cleaned itself out. People would not want that kind of beer in this country. In this country they want something that has more extract in it.

The next beer that I notice in this schedule is "export beer," which has 1.20 per cent of sugar, which is still low. In their ale they have only 0.95 of sugar. That is rather low.

You could take this same beer and analyze it at a different stage—that is, immediately after it was brewed—and you would find a very much larger percentage of sugar and a less percentage of alcohol, which we consider here to be desirable—a larger percentage of extract and a less percentage of alcohol. In fact, the brewer thinks that he is the true temperance advocate in giving you a beer with a low standard of alcohol and a high standard of extract.

The CHAIRMAN. Now, Mr. Brown, as a business man and the head of a business of this kind, speaking from your standpoint of experience and knowledge, do you think that the Government ought to exact a standard of beer, or that beer, when put out for sale to the public, should have a certain amount of extract—a certain percentage?

Mr. BROWN. I should think it would possibly be wise for the United States Government to make a standard for beer below which it should not go in original gravity.

The CHAIRMAN. That is what I wanted to know.

Mr. BROWN. Yes.

The CHAIRMAN. Of course, any State law of that kind would make conflicting business interests?

Mr. BROWN. Yes; it might ruin the business of the brewers of one State and help those of another. For instance, if the legislature of New York State should pass an act requiring a certain standard of beer to be manufactured in this State or city, it might bring beer in

from Connecticut, New Jersey, or Massachusetts that was not up to standard, and by that means injure the business of the brewers of this State and city.

If a law passed by the General Government were to be brought to bear, as it would be, all over the United States, I can see no objection to such a law. In fact, I believe the brewers would welcome some standard fixed by the United States Government. That would relieve them of this cry against bad beer or impure beer, and all that sort of thing, from which they are unjustly suffering.

The CHAIRMAN. Coming down now to the original question as to the purity of goods. You use nothing in the Long Island brewery but what you consider perfectly healthful and proper for people to drink?

Mr. BROWN. We do not, and we drink it ourselves.

I wish to say this, however, Mr. Chairman, that there is a great deal of beer that leaves any brewery in good condition but is spoiled by the bad conditions under which it is afterwards drawn, and the brewer suffers for the sins of the retailer. I think that more beer spoils in the retailers' hands than ever left the brewery spoiled. If you draw beer under wrong or improper conditions you injure a good product. If a man has foul pipes through which he draws his beer, no matter how the beer is when it enters those pipes, it will come out full of bacteria of all kinds that do not belong there, and it will come out very much changed in its character; and I think that that is particularly the reason of the brewers occasionally being blamed for making poor or bad beer. Bad conditions under which beer is drawn are for the most part responsible.

The CHAIRMAN. And the way it is kept before being drawn, I suppose?

Mr. BROWN. Yes.

The CHAIRMAN. You mean, in other words, that if a man took good champagne and put it in a dirty bottle or should draw it through a dirty pipe he would have poor champagne, no matter how good it originally was?

Mr. BROWN. Yes.

TESTIMONY OF JOHN BAUER.

JOHN BAUER sworn and examined:

The CHAIRMAN. What is your business?

Mr. BAUER. I am a brewer.

The CHAIRMAN. Where is your place of business?

Mr. BAUER. I am with F. & M. Schaeffer Brewing Company, in this city.

The CHAIRMAN. What position do you hold with them?

Mr. BAUER. I am the brew master with that concern.

The CHAIRMAN. How long have you been in that business?

Mr. BAUER. You mean how long I have been with my present firm, or how long I have been in the trade?

The CHAIRMAN. How long have you been in the beer-making business?

Mr. BAUER. About thirty-six years.

The CHAIRMAN. Did you ever brew beer in any other country besides this?

Mr. BAUER. Yes; I learned my trade in Germany as an apprentice. I was a brewer there before I came to this country.

The CHAIRMAN. What did they use in Germany in the manufacture of beer?

Mr. BAUER. In my time we were using hops, malt, and water, and a little rice.

The CHAIRMAN. Whereabouts in Germany did you use these?

Mr. BAUER. I spent my apprenticeship years in Mannheim, on the Rhine, in Germany.

The CHAIRMAN. When did you come to this country?

Mr. BAUER. In 1870.

The CHAIRMAN. You make your own yeast?

Mr. BAUER. Yes, sir.

The CHAIRMAN. Do you make it here any different from the manner in which you made it in Germany?

Mr. BAUER. No, sir.

The CHAIRMAN. You are no less careful here and no more careful?

Mr. BAUER. We are just as careful as we were in Europe.

The CHAIRMAN. The yeast has to be developed in the open air, as I understand it?

Mr. BAUER. Yes.

The CHAIRMAN. Do you use in this country any preservatives in your beer?

Mr. BAUER. No, sir.

The CHAIRMAN. Do you pasteurize it?

Mr. BAUER. We do that, but only for export.

The CHAIRMAN. Do you bottle beer without pasteurizing it sometimes?

Mr. BAUER. We do, sir.

The CHAIRMAN. For local trade?

Mr. BAUER. Yes, sir.

The CHAIRMAN. To what degree Fahrenheit do you bring the heat in pasteurizing?

Mr. BAUER. It depends on how long the beer has to keep and where it is going. We bring it up to a heat of 145° or 150° , some of it, and some of it to 160° F.

The CHAIRMAN. Do you use any substitute for hops?

Mr. BAUER. No, sir.

The CHAIRMAN. Did you ever use any in Germany?

Mr. BAUER. No, sir.

The CHAIRMAN. You have the real hop there?

Mr. BAUER. Yes, the real hop.

The CHAIRMAN. Do you use any substitute for malt here?

Mr. BAUER. I use some cerealine and rice.

The CHAIRMAN. That is a preparation of corn—cerealine?

Mr. BAUER. Yes.

The CHAIRMAN. Do you use any coloring matter?

Mr. BAUER. Very little.

The CHAIRMAN. You intend to keep your beer up to a certain percentage of malt extract?

Mr. BAUER. Yes.

The CHAIRMAN. You realize that there is a difference between beers, some having a higher malt extract than others?

Mr. BAUER. Yes; it depends on the fermentation and on the brewing process.

The CHAIRMAN. In Germany, did you have to keep the beer up to a certain standard of malt extract?

Mr. BAUER. We did; but generally it was because of the Govern-

ment. We had to use so much malt to a barrel of beer, and it was not told to the brewer how heavy he had to make the beer. He could do as he pleased.

The CHAIRMAN. But there must be so much malt to a barrel of beer?

Mr. BAUER. Yes; on account of the taxes.

The CHAIRMAN. The Government kept account in Germany of the amount of malt you used?

Mr. BAUER. Yes.

The CHAIRMAN. And they kept account of the number of barrels of beer you sold?

Mr. BAUER. Yes.

The CHAIRMAN. And they collected the revenue in Germany in that way, I understand?

Mr. BAUER. Yes, sir.

The CHAIRMAN. Do they allow you to use acids in the beer in Germany?

Mr. BAUER. No, sir.

The CHAIRMAN. Is there a law against it?

Mr. BAUER. Well, I do not know that there is. I think it stands to the brewer, whether he wants to use it or not.

The CHAIRMAN. So far as you are concerned, you do not use anything but what is healthful and good for people to drink?

Mr. BAUER. I never have done any other way.

The CHAIRMAN (exhibiting to witness the paper headed "Chemical combinations of standard beers"). This is a paper showing what is supposed to be the fixed standard of beer in Germany—the standard fixed by Rupp, the chemist. Please look it over and see if it is about what you understand the standard of beer to be—that is, it gives the amount of alcohol, the amount of sugar, etc., in different kinds of beers.

Mr. HUPFEL. Who is this chemist, Rupp?

The CHAIRMAN. As I understand, he is or was a German chemist, who, after a long course of study and experiments, fixed this standard for different beers. The matter has only just been called to my attention.

Mr. HUPFEL. In Germany, is this?

The CHAIRMAN. As I understand it, this is in Germany, and perhaps it is made a part of the German law, but I do not know. I should like to have some information on that subject and shall probably have some.

Mr. HUPFEL. I suppose it is like different chemists having different ideas or just like different doctors would have different ideas.

Mr. BAUER. These analyses, I think, must be of a very old beer—a very old lager.

The CHAIRMAN. That is, you judge that from the amount of sugar and the gravity?

Mr. BAUER. Yes. We never keep beer so old as this in this country.

The CHAIRMAN. You mean that upon looking over this paper, which is headed "Chemical combinations of standard beers," purporting to give what is called a standard of beer in Germany, assuming that that is a correct standard, it strikes you as being old beer?

Mr. BAUER. Yes.

The CHAIRMAN. On account of its specific gravity and the proportions given of these different kinds of beer?

Mr. BAUER. Yes.

The CHAIRMAN. "Lager" means "stored," does it not?

Mr. BAUER. Yes.

The CHAIRMAN. In Germany they keep their beer longer than we do here, do they not?

Mr. BAUER. Not always, I think. It may be so in some cases.

The CHAIRMAN. The people of this country want a fresh beer, right from the vat, do they not?

Mr. BAUER. Yes; it is more uniform and better for the body. It is heavier.

Mr. BROWN. He means that there is more extract in it and less alcohol.

The CHAIRMAN (to Mr. Brown). That is substantially what you have said that fresh beer is—more of the malt extract and less alcohol—and that aging beer or storing beer increases the alcohol and decreases the amount of malt extract.

Mr. BROWN. Yes.

The CHAIRMAN (to Mr. Bauer). Does the law over in Germany, according to your recollection, require the keeping of beer any length of time before it is sold.

Mr. BAUER. No; the laws do not—not to my knowledge. I think there is more young beer sold over there than in this country.

The CHAIRMAN. How long is it since you were there?

Mr. BAUER. I was not there since I left the old country.

The CHAIRMAN. How long ago is that?

Mr. BAUER. Thirty years ago.

The CHAIRMAN. There may be a difference now?

Mr. BAUER. There may be.

Mr. HUPFEL. For export beer they age the beer more. For present-use beer—for use in the neighborhood—they drink that as soon as it is ripe.

Mr. LIPPE. That question as to age of beer reminds me of a question that I should like to ask this gentleman: What storage time would be best for American beers—how long a time would it be best to have the beer stored?

The CHAIRMAN. I think he has already answered that. He says that the fresher the beer is, the less alcohol there is and the more malt extract there is.

Mr. LIPPE. True, but he has not given any length of time at all. I would like, in view of future action that Congress might take, to have an expression of opinion from competent men as to what would be the best time for beer to be stored.

The CHAIRMAN. The chairman will adopt that question. How long would be the best time to have beer stored?

Mr. BAUER. In my practical view it should not be stored over three months, but sometimes the brewer can not help it and it gets a little older. But I think a glass of beer is best when stored about three months, whether for export or for any use.

The CHAIRMAN. If beer is kept in cold storage there is not the same danger of fermentation, is there—if it is kept in a steady, cold atmosphere?

Mr. BAUER. No, there is no danger; but it does not get any better.

The CHAIRMAN. And the tendency is to increase in alcohol and decrease in malt extract?

Mr. BAUER. That is it.

The CHAIRMAN. And the malt extract itself becomes alcohol by age?

Mr. HUPFEL. I should like to ask Mr. Bauer whether he does not think that beer six weeks old is just as good as a three-months-old beer?

Mr. BAUER. I guess that is all right. You can use for home trade a beer just as good in six weeks as in three months, for home consumption.

Mr. HUPFEL. I thought he said three months or over.

The CHAIRMAN. He did not say that. He said he thought it ought not to be kept over three months.

Mr. CLARKSON. I would like the Senator to ask Mr. Bauer if there is any advantage in keeping beer after it is fully ripe—if it is ripe in six weeks, whether it improves in any way as a beverage after that?

The CHAIRMAN. This gentleman (Mr. Bauer) has given his opinion that it does not improve; that after it matures age does not then improve it.

Mr. HUPFEL. Like ale, it gets harder.

The CHAIRMAN (to Mr. Lippe). I wanted to ask you, Mr. Lippe, and do not remember whether I did or not, your idea as to whether we ought not to have a national law in regard to beers, and what kind of law you would favor.

Mr. LIPPE. I stated, Mr. Chairman, that we should work for a law that could absolutely not be evaded. It is of the very essence of the thing that the law should not be and could not be evaded.

The CHAIRMAN. That is certainly the essence of all law.

Mr. LIPPE. That law should make it compulsory to brew beer out of grain and hops only. It should be a law capable of absolute enforcement and that could not be evaded. I think such a law would be a benefit to the trade and to the consumer, and would build up a great trade, provided the Government would enable us to buy the best materials. Congress in its wisdom prevents us from using Canada malt, the best material for making beer. That policy has destroyed the malting industry in the East and has not made the beer any better. It has forced the brewers practically to use a lower grade of barley and to use rice and hominy in order to get the same result that we used to get formerly from the best Canadian barley. The tariff duty became so high that it absolutely prevented the importation of Canadian barley except in nominal amounts. That is one of the things from which the brewing industry has suffered. Neither has it benefited the American farmer to any extent. He does not receive any more for his goods than he would if Canadian barley were admitted.

The CHAIRMAN. If you brew out of American cereals, you have to pay the American farmers' price.

Mr. LIPPE. Yes, certainly. The opinion seems to be that if Canadian barley is excluded from the American market the American farmers will get a higher price for their goods. The reverse has been the truth. It has been a lower price ever since.

The CHAIRMAN. That is entering upon a tariff discussion, and we shall have to discuss that in some other department of the case.

Mr. BROWN. Canada raises only a few million bushels of barley, and we use between 40,000,000 and 50,000,000 bushels.

Mr. LIPPE. But you can not deny that Canadian barley is better than any barley that we can buy.

Mr. BROWN. I most emphatically do deny it. We grow just as good barley in this country as in any country in the world.

Mr. JOSEPH LIEBMANN. With reference to this question that has sprung up here in regard to the difference in barley produced in this country and in Canada, I will say that at the time when that tariff law was first put in force certainly our barley grown here in the United States was inferior to the Canadian barley, but on account

of the demand our farmers are producing just as good barley to-day as we had twenty or even ten years ago. The same is true of our hop growers in this State. The hops grown in New York State in the last six or eight years are much better than they were ten or fifteen years ago.

As to the question raised here regarding the difference between the beer brewed in other countries and beer brewed in this country, I only speak as to the beer brewed in Germany and in the United States.

I will say in advance that I was born a brewer and have been in the business for forty-two years, particularly in Germany and in this country.

The difference between brewing in Germany and in the United States is much affected by the conditions of the atmosphere of the two countries. The atmosphere in Germany is of such a nature that when you expose anything that has to undergo certain fermentation it will keep longer than if you produce the same here.

The CHAIRMAN. It takes longer to ferment in the German air?

Mr. LIEBmann. It takes longer, and there is less influence exerted by the outside atmosphere, for the reason that beer brewed in Germany keeps the taste much better than beer brewed here.

The CHAIRMAN. It is longer in maturing?

Mr. LIEBmann. Yes. That is the reason we have to brew different beer in this country from that brewed in Germany.

Mr. BROWN. That point made by Mr. Liebmann is practically covered by my remarks as to the peculiar bacteria of any particular neighborhood.

The CHAIRMAN. Yes; it is exactly in line with what you suggested. He says that the fermentation there is longer and that it takes longer to mature the beer, and that it retains its taste longer.

Mr. LIEBmann. That is the very reason that the beer here is different in taste from the German beer.

In regard to the goodness of the beer and the purity of the beer, I guess our beer here is just as pure and just as good as any beer brewed in any other country in the world.

The CHAIRMAN. You do not use anything, Mr. Liebmann, so far as you know, that is injurious to the public health?

Mr. LIEBmann. I do not want to intrude any point or suggestion into this investigation, but I will say that for ten or twelve years I have advocated only the use of malt and hops.

The CHAIRMAN. As a matter of fact, the use of unmalted cereals is very common in this country, is it?

Mr. LIEBmann. It is common, yes, and the taste of our consumers favors this rank beer better, which has some raw fruit mixed with it.

Mr. BROWN. Ask Mr. Liebmann, Mr. Chairman, if it is not a fact that the great increase in the production of beer in this country was not until the introduction of rice or corn into beer here and after they had stopped using malt. Ask him if the trade did not then jump up.

Mr. LIEBmann. The gentleman has asked a question that can not be answered very quickly. In regard to the increase of consumption of beer, I would remark that there has been a great increase in the population. The consumers of beer have increased in number. In 1854, 1855, and 1856, when I was sitting on a beer wagon—a wagon of a single horse—people were standing on the corners saying, "Here comes the Dutchman with lager beer and sauerkraut." At that time we had to educate the people of this country to drink beer. We do not have to do that now.

The CHAIRMAN. The population has increased. The question of Mr. Brown was whether this enormous increase of beer has not taken place largely since it has been changed in character by the use of unmalted cereals.

Mr. LIEBMAN. The large increase of the production of beer was after our civil war, after 1867. It has steadily increased. Is not that so, Mr. Hupfel?

Mr. HUPFEL. Yes; it has dropped again within the last few years.

Mr. BROWN. The great increase did not come until about 1879 or 1880, somewhere along there.

The CHAIRMAN (to Mr. Bauer). Do you advocate the use of anti-septics or preservatives in beer at all?

Mr. BAUER. It is not intended, except for export.

The CHAIRMAN. Do you think that people who import beer into this country use it?

Mr. BAUER. I could not tell. I am not acquainted enough with that subject to say that.

The CHAIRMAN. Can they keep it in any other way except by pasteurizing it?

Mr. BAUER. I recollect asking at one time why they washed the inside of the barrel with alcohol, and the answer was to keep the beer better in different countries. That was what I was told.

The CHAIRMAN. Do you ever use salicylic acid?

Mr. BAUER. No; we do not.

The CHAIRMAN. Do you know anything about the use of salicylic acid in the preservation of beer?

Mr. BAUER. I know it is used.

The CHAIRMAN. Is it not used in bottled beer?

Mr. BAUER. It is used in bottled beers for export.

Mr. HUPFEL. I would like you to ask Mr. Liebmann, Mr. Chairman, as an advocate of malt and hops alone, if he can tell the difference between beer made from those and that made from cereals—whether anyone can tell what it is made of.

Mr. LIEBMAN. It would be a hard thing to tell whether beer is made particularly of corn or rice. It might be detected when rice is used, but I doubt if it could be detected when corn is used. I am not a practical brew-master any more. I was so twenty years ago.

Mr. HUPFEL. I have tried it in my brewery, and have made beer of rice and corn, and rice and grits, and rice and glucose; have kept it different lengths of time, and found that there was not anybody who could say which was which out of the four different kinds. It was impossible to say of what either of the beers was brewed.

Mr. BROWN. Will you please ask Mr. Liebmann, Mr. Chairman, if a beer brewed partially from either rice or corn and the balance of malt is not a beer of better keeping quality than one brewed altogether from malt?

The CHAIRMAN. You have heard that question, Mr. Liebmann. Will you kindly answer it?

Mr. LIEBMAN. I would not care to give an opinion on that.

The CHAIRMAN. You would not care to say whether the one was a better "keeper" than the other?

Mr. LIEBMAN. No; in my brewery we have different beers brewed, and I could not tell as to others.

Mr. BROWN. The difficulty with an all-malt beer is that it contains an excess of albuminoids, and they are the brewer's bane—anything over what is required for the treatment of the yeast. After that it is

simply an element of souring in the beer. Rice and corn contain practically no albuminoids.

The CHAIRMAN. The albuminoids are what?

Mr. BROWN. They are the vegetable albumen of the grain. That is similar to the animal albumen—the albumen of the egg, except that it is a vegetable albumen—so that really an all-malt beer has less keeping quality than beer brewed partly from malt and any other cereal, such as rice. An excess of albuminoids is a damage to the beer.

The CHAIRMAN. To-day they use more or less of salicylic acid and some combination of lime?

Mr. BROWN. They use bisulphite of lime very largely in England. I do not think it is very much used here.

The CHAIRMAN. That is for the beer that they are to export?

Mr. BROWN. Yes, and for washing the utensils. After the vats are washed out they spray on them a solution of bisulphite of lime.

The committee adjourned to Wednesday, November 15, 1899, at 10.30 a. m.

COMMITTEE ON MANUFACTURES, U. S. SENATE,
IMPERIAL HOTEL, NEW YORK CITY,
Wednesday, November 15, 1899.

TESTIMONY OF GEORGE B. SADLER.

GEORGE B. SADLER sworn and examined:

The CHAIRMAN. What is your business?

Mr. SADLER. I am editor of Bonfort's Wine and Spirit Circular.

The CHAIRMAN. This committee is investigating the question of food adulterations, which means, of course, food and drink. We are endeavoring to ascertain what we can regarding, first, adulterations that are deleterious to health, and, second, adulterations that are mere sophistications and are sold in fraud of the consumer. In other words, we are endeavoring to ascertain what goods are sold not for what they are and what goods are sold that are bad in themselves. In connection with your business, Mr. Sadler, have you had occasion to look up the sophistication of goods in the wine and spirit business?

Mr. SADLER. Yes; I have been for many years deeply interested in the subject, and have investigated it very thoroughly.

The CHAIRMAN. Will you state to the committee to what extent, as far as your knowledge and information goes, these adulterations and sophistications exist?

Mr. SADLER. As to the leading brands of imported spirits, particularly since the rate of duty is very high, I am thoroughly impressed that there is more spurious spirits sold in this country under counterfeit labels than there is of the genuine. Investigations made by me have led me to believe that that is no exaggeration.

The CHAIRMAN. How do they do it?

Mr. SADLER. They do it by obtaining, I think, illicit spirits, from which the United States Government receives no tax. That material is put in bottles under counterfeit labels, either labels that are coun-

terfeited so that they are facsimiles or so that they will deceive the unwary buyer.

The CHAIRMAN. Have you any samples of such labels?

Mr. SADLER. I have a great many.

The CHAIRMAN. You are now alluding to imported goods?

Mr. SADLER. Yes.

The CHAIRMAN. For instance, imported Scotch whiskies?

Mr. SADLER. Yes.

The CHAIRMAN. And imported wines?

Mr. SADLER. Yes.

The CHAIRMAN. And imported brandies?

Mr. SADLER. Yes, as to those that have established a reputation.

The CHAIRMAN. Do they use the same bottles?

Mr. SADLER. Sometimes they refill the bottles. That is very extensively done in the saloons themselves, where wines and spirits are sold by the drink. The fact is that there are comparatively few places in this country that do not do it.

The CHAIRMAN. The retailer may be able to do that because there would be no way to watch him?

Mr. SADLER. I say that where the liquor is sold by the drink over the bars the bottles are refilled.

The CHAIRMAN. You say that this is done to quite an extent at wholesale, too?

Mr. SADLER. At wholesale, where sold in the bottles. The cases and everything are made to simulate the imported goods. But that is not confined to imported goods, but to any brand of goods. The moment it establishes a reputation it is at once a fair field for that sort of thing.

The CHAIRMAN. Does not the copyright law protect the owner of the brand?

Mr. SADLER. It does not, at all.

The CHAIRMAN. What suggestion would you make to this committee by way of securing a remedy for that?

Mr. SADLER. I would recommend that a bill be passed to amend section 3449 similar to the measure that passed the House and Senate on the last day of the session of 1896—resolution 4580—which provides for an amendment to section 3449 of the Revised Statutes. It amends, or should amend, the Revised Statutes so that any person who sells, or keeps on hand for sale, foreign or domestic wines or liquors under any name other than the proper name or brand known to the trade shall be subject to fine and imprisonment.

The CHAIRMAN. The word "and" quoted there ought to be the word "or." That matter should be left to the discretion of the court, and perhaps that is the reason why the President gave it the "pocket veto."

Mr. T. J. MURRAY. Ask the gentleman how much the Government is being yearly robbed out of in the way of revenue through the instrumentality of these imitations—the imitating of imported brands by artificial and surreptitious means.

The CHAIRMAN. Have you any knowledge on that subject or any opinion?

Mr. SADLER. I have an opinion. Of course, there must be a good deal of guesswork about a matter of this kind, but there is no doubt that the Government yearly loses millions of dollars by this particular thing. I do not think it is at all an exaggeration to say that it must be \$6,000,000 just upon imported goods alone.

The CHAIRMAN. That, I understand, is on the theory that the tax is not paid; that the goods that are sold as imported goods, if they were imported goods and paid the duty, that duty would make a difference of several millions, possibly six millions, in the revenue of the Government?

Mr. SADLER. In some cases the United States Government receives no revenue at all from the spirits that are made. A very large quantity of illicit spirits are made that go directly into the bottle, and the very moment that it goes into the bottle it loses its identity so far as the Government is concerned, and it can be sold with freedom. The Government derives no benefit at all and no revenue from spirits of that description.

The CHAIRMAN. They would have to make it, then, from illicit spirits, or from "moonshine whisky," as it is called?

Mr. SADLER. They do it to a very large extent. That gives them an opening for the distribution of that sort of spirits. Of course there is a good deal of tax-paid spirits that go into the imported goods, the Government, therefore, losing the difference between the import duty and the internal-revenue tax—something, I believe, like \$1.40 a gallon for spirits.

Mr. MURRAY. I think the witness refers simply to the loss to the Government on spirits alone. Would you kindly ask him, Mr. Chairman, what he believes our Government loses on malt liquors?

The CHAIRMAN. Have you given the subject of malt liquors any attention?

Mr. SADLER. Not so much. I know that a number of the brands of imported beers are very largely counterfeited in this country, but to what extent I do not know.

The CHAIRMAN. Have you any samples of the labels that are counterfeited on beers or malt liquors?

Mr. SADLER. I am not sure whether I have or not, but I am in a position where I can obtain labels of the counterfeited kind.

The CHAIRMAN. I wish, for the benefit of the committee, that you would be good enough to send me some, and I will see that they are returned to you—some samples of the counterfeit labels that are used in this country, to make the purchaser think that he is buying imported goods.

Mr. SADLER. I will do so. I have a large book of these labels, and if I may bring it up to the committee and show you what they are, I shall be glad to do so. It is quite a valuable possession, however, and I should like to bring it up myself.

The CHAIRMAN. Very well. I will see that it is properly cared for while in my possession, and I merely wish to look at the labels. I can then explain to the committee what the facts are from my own observation. You understand that this is done by the rectifiers in this country?

Mr. SADLER. Some of them; yes, sir.

The CHAIRMAN. You do not know where the spurious spirits come from?

Mr. SADLER. No. In some cases I do. I know some of the houses that make them. Some of them are notorious in the trade. There have been all kinds of injunctions requested, and our laws render no kind of redress—either State or national.

TESTIMONY OF HEYWOOD C. BROUN.

HEYWOOD C. BROUN, sworn and examined.

The CHAIRMAN. What is your business, please?

Mr. BROUN. I am a bottler of Bass's ale and Guinness's stout.

The CHAIRMAN. Where do you bottle it?

Mr. BROUN. In Sixteenth street, New York.

The CHAIRMAN. Where is it manufactured?

Mr. BROUN. The ale is manufactured at Burton-on-Trent, in England.

The CHAIRMAN. And shipped to this country how?

Mr. BROUN. In hogsheads of 62 gallons each.

The CHAIRMAN. You have heard the testimony of the last witness who was before the committee, the editor of Bonfort's Wine and Spirit Circular, who spoke in regard to imitated labels?

Mr. BROUN. Yes.

The CHAIRMAN. This committee is inquiring regarding goods sold to the people that are either deleterious to health or sold in fraud of the consumer. I should like to know if you have any evidence to offer to the committee showing that goods are improperly marked?

Mr. BROUN. We have had in the country in the past five years 35 to 40 cases of forgeries and colorable imitations of our labels. In almost all the cases the ale was American ale. The labels are perfect facsimiles of ours; in some cases made from photographs. We have, of course, prosecuted some cases and obtained some convictions—in Boston two convictions of parties putting up this ale for forgeries of these labels of ours. One of the parties convicted was sent to prison for six months.

The CHAIRMAN. That was done under a State law?

Mr. BROUN. Yes; and we could have had the same convictions in the United States courts. We have taken a number of infringements of our trade-marks into the United States courts, and we have never had any trouble in getting convictions, but there has been a good deal of trouble in getting evidence. The reason why the Government loses is that foreign ale pays a duty of \$6 a barrel, while domestic ale pays an internal-revenue tax of only \$2 a barrel—\$12 a hogshead and \$2 a barrel. So when they put up counterfeits of our labels they sell American ale, and the Government loses the difference, certainly.

We had some goods seized by the United States Government for being carried in packages that were not the original packages, or the marks that they should bear. They were counterfeits of our labels. The Government seized the goods, and they were ordered to be sold at public auction, and they were sold at public auction. So that we were doubly injured, inasmuch as the men who bought them had bought them from the United States Government.

The CHAIRMAN. So that you could not stop the sale or the consumption?

Mr. BROUN. No. We protested very vigorously to the United States authorities against selling these goods, but they sold them in spite of our protests. We placed the matter in the hands of our attorney, Mr. Delancey Nicoll, but he was unable to do anything about it. They were sold in the market.

The CHAIRMAN. Do I understand you to say that there is any United States law now under which you could arrest and punish people, or was it a State law?

Mr. BROUN. It was under a State law; but I think we could have done it in the United States courts and under the United States law. It was a counterfeiting case. The imitation of our signature is a forgery.

The CHAIRMAN. Have you had your attention called to the bill mentioned by the previous witness?

Mr. BROUN. Yes.

The CHAIRMAN. That is intended to apply directly to cases of this kind?

Mr. BROUN. Yes. A recent law was passed by the State of Massachusetts similar to that, but I think a fuller law than that. I can send you a copy of that bill.

The CHAIRMAN. I should be glad to have it. You do not manufacture the ale yourself here?

Mr. BROUN. No.

The CHAIRMAN. And you could not testify, I suppose, as to its ingredients?

Mr. BROUN. No; I could not; but a member of our firm is here who is a chemist, and he could testify to it. You have had samples of our ale, and I have been subpœnaed to appear.

The CHAIRMAN. Yes; I have taken samples of practically everything I could get, and they are now in the hands of the Government chemists of the Agricultural Department.

Mr. BROUN. Of course we suffer greatly, also, from the refilling of bottles. People buy our bottles and refill them, but it is hard to get testimony against them.

TESTIMONY OF FRANCIS WYATT.

FRANCIS WYATT, sworn and examined:

The CHAIRMAN. Where do you reside?

Mr. WYATT. In New York City.

The CHAIRMAN. What is your profession?

Mr. WYATT. I am a brewers' chemist.

The CHAIRMAN. What training have you had in the matter of your profession? Just state briefly.

Mr. WYATT. I have been practicing for the last eighteen years as a chemist and bacteriologist, devoting myself professionally exclusively to the interests of fermentation, the manufacture of beer and of whisky.

The CHAIRMAN. Were you present when I explained to the other gentlemen the scope of this investigation?

Mr. WYATT. I do not know that I was.

The CHAIRMAN. The Senate Committee on Manufactures are inquiring, under the authority of the Senate of the United States, with reference to two features of fact regarding food and drink: First, as to what, if any, adulterations are resorted to that may be considered deleterious to public health, and secondly, what adulterations are resorted to that are simply to sophisticate or cheapen the goods and deceive the consumer.

With regard to the first branch of the case—namely, adulterations that are deleterious to public health—let me ask you what is generally used in the manufacture of beer? You might, perhaps, state first what you call beer.

Mr. WYATT. I suppose your attention has been called, Mr. Chair-

man, to the fact that there is no law—there is nothing on the statutes, either national or State, to define beer.

The CHAIRMAN. I know that.

Mr. WYATT. I have on various occasions suggested that a proper definition of beer would be "a nutritive infusion of maltose sirup, made bitter with hops and fermented with yeast." I have submitted that definition, because that is what the beer of this country really is to-day, and that is why I am able to say without fear of contradiction from people who know anything about the industry that there is practically no adulteration whatever practiced in the brewing of beer in the United States. The old German method of manufacturing beer was simply to make an infusion of malt, boil that infusion with hops, and ferment it with yeast. But the beers which were produced at that time could only be made salable on the condition of keeping them for a very long period of time in cold storage. That brought about two things. In the first place, it produced a large amount of alcohol from the complete fermentation not only of the maltose present, but of various other complex sugars, which only ferment during a very long storage period. That also brought about an acidity or hardness in the beer.

It is very possible that at the time that those beers were made they suited the public taste and were probably suited to the climatic conditions of Germany, but when those beers were introduced into this country and made in that way, as they were made originally some twenty-five or thirty years ago, they did not suit the climatic conditions of the United States, nor did they suit the palates of the American consumers. It was desirable to make a lighter beer, and by that I mean a beer which contains less alcohol; and it was also desirable to make a beer which should please the æsthetic as well as the epicurean sense.

In other words, the American looks at his beer generally before drinking it, and invariably drinks it out of a glass. The German beer drinker drinks his beer out of a mug, and it does not make any difference to him what it looks like so long as it suits his palate. It is a very difficult matter to make brilliant beer from the malts made in this country, because our malts are not comparable in any way to the malts made abroad from barleys grown in the chalky, light, calcareous soil of Germany and England.

Our American malts contain very much more of what is technically known as albuminous matter, proteid matter, most of which becomes soluble during the malting process and passes into the beer.

Now, it is that albuminous matter which has a tendency to make the beer unstable, because it affords nourishment not only for the yeast but also for the various organisms which are always swarming in the air and which get into the beer under almost all conditions and are the cause of cloudiness and acidity and bad taste.

All these considerations led to investigations which have now become classical—investigations by a great many scientists. During the malting or mashing process a thing is produced known as diastase. This diastase has the power, under the influence of moisture, of transforming starch into maltose sugar. Now, there is a large excess of diastase in malt; and it was argued that inasmuch as the largest percentage of diastase is starch, and since there is more diastase present in the malt than is necessary to transform that starch into sugar, why not at once utilize the diastase by using starch, and in that way diminish the percentage of albuminoids?

After many experiments that was eventually done; and it has now become, I think, the universal practice throughout the United States to add a large or a small quantity (according to the condition of the malt of the season) of extraneous starch.

The problem arose, What is the more economical form of starch to use? If we go to the starch manufacturer, we have to pay him a profit on the manufacturing process. Why not take his raw product, corn or rice, and manufacture our maltose directly in the brewery, without going through all the inconvenient processes of manufacturing the starch from the raw grain?

That is as brief a statement as I can make to lead up to the main statement that brewers now use, in addition to malt, various percentages, say from 20 to 35 per cent, of starch-bearing cereals, notably rice and corn; sometimes a little raw barley is used, but from the brewer's standpoint it is mainly a question of current market price; that is what influences the brewer in the starch-bearing material that he buys.

Some chemists and some very excellent brewers have argued that in order to prepare this maltose from the raw cereal in the brewery a great deal of unnecessary time was consumed and that it would answer every purpose to buy a sirup, which, to all intents and purposes, would be the same article as they themselves made in the mash tub. This article is glucose, which, as you probably know, is made from Indian maize, by boiling it with a very small quantity of acid, subsequently neutralizing that acid with marble dust, and getting it down to the desired consistency.

The CHAIRMAN. Is that grape sugar or is it glucose?

Mr. WYATT. They are both practically grape sugar, but in order to distinguish between them there are two forms in which it is sold. One is a hard, amorphous mass known as grape sugar, very much resembling ordinary sugar in everything but its crystalline shape. They are practically identical—that is to say, the method of their manufacture is practically the same, one, however, being more evaporated than the other.

The CHAIRMAN. You consider, do you, that the use of these starch-bearing cereals leaves the beer just as healthy and as nutritious and as desirable for the stomach as if it were all malt?

Mr. WYATT. Absolutely so. And it may, perhaps, add something to the importance of that statement if I say that it is impossible by any means known to chemistry or physics to distinguish between a beer made from all malt and a beer made from the addition of any of the substitutes which I have named.

The CHAIRMAN. And is it difficult even in chemical analysis to find that difference?

Mr. WYATT. I mean to say that it is impossible by chemical analysis to find that difference.

The CHAIRMAN. And impossible also to find it in the taste or flavor?

Mr. WYATT. Impossible in the taste or flavor. So far as the addition of those substitutes is concerned, it would be impossible to detect any difference in taste or flavor, because very nearly all the characteristic flavors of beer are derived from fermentation—from the nature of the yeast used in fermenting.

The CHAIRMAN. The principal other ingredient of beer, next to malt, is hops?

Mr. WYATT. Yes.

The CHAIRMAN. Do you know, and is it customary, within your observation and experience, to use any substitute for hops?

Mr. WYATT. I have never, throughout my whole experience in this country, met with a single instance in which a substitute for hops was used.

The CHAIRMAN. Hop extract, I suppose, you consider hops?

Mr. WYATT. I do not include that, because there is only one brand of hop extract sold in this country, and that is a petroleum-ether extract of hops.

The CHAIRMAN. The extract really carries all the hops wanted?

Mr. WYATT. All the essential elements of the hops in small bulk. But it is proper to say that that hop extract is used to a very limited extent. Brewers have got into the habit of watching the hop market; and if hops are extremely cheap during one season, they buy large quantities and send them up to the hop-extract man, and he extracts them and sends them back the product.

The CHAIRMAN. In that process and in the use of hop extract instead of hops is there anything, in your opinion, that could in any way affect the public health?

Mr. WYATT. Absolutely not.

The CHAIRMAN. It is just as wholesome and good as the hops?

Mr. WYATT. Absolutely in every respect.

The CHAIRMAN. Do you know of any habit or practice among any of the brewers of using an absolute substitute for hops?

Mr. WYATT. I have never heard of or met with one.

The CHAIRMAN. It has been sometimes charged or stated that aloes was used in beer?

Mr. WYATT. I have seen such statements in the newspapers, but I have never come across such a thing myself.

The CHAIRMAN. What could aloes be used to take the place of in beer?

Mr. WYATT. It could only be used to communicate a bitter taste. But aloes are, I believe, chiefly used in medicine as a drastic purgative, and it would be a very undesirable addition to be made to beer.

The CHAIRMAN. How long have you been acting as chemist here in this country in connection with the brewing industries?

Mr. WYATT. Exactly thirteen years.

The CHAIRMAN. And before that time?

Mr. WYATT. Before that time I was with Pasteur, in Paris.

The CHAIRMAN. During the thirteen years have you had occasion to analyze different samples of beer?

Mr. WYATT. I have analyzed 20,000 samples of beer during that period.

The CHAIRMAN. Have you ever found any aloes in any that you have analyzed?

Mr. WYATT. Never.

The CHAIRMAN. Your analysis has been such that you would have discovered it if there were any?

Mr. WYATT. Yes; absolutely.

The CHAIRMAN. Upon the question of fermentation, about which we have had some evidence, and which is not new to me, I wish you would describe as briefly as you can the process of fermentation used generally here in this country from the beginning, the making of the yeast—how it is started at work and how it continues.

Mr. WYATT. Perhaps it would be better for me to say that the beer, after being boiled in the kettle, and having been brought to the required gravity or strength, is sent, over a cooler, into a large receiving vat and there mixed with yeast. Now, this yeast is a plant,

a fungous growth, which becomes acclimated to each brewery and goes on from year's end to year's end, year in and year out, without any change at all. In other words, just as we sow potatoes and get a proper potato crop, so we plant yeast and get a proper yeast crop. If we use 100 pounds of yeast, we expect to get 500 pounds as a crop.

The CHAIRMAN. A crop of what?

Mr. WYATT. A crop of yeast—yeast is a plant which grows as grass grows, and just as we get 14 bushels to 1 from wheat, so we expect to get four or five pounds to one from yeast that we put in the beer. That yeast either rises to the top of the fluid, in fermentation, or it sinks to the bottom. In the manufacture of ale it comes to the top, because the temperature used in the fermentation of ale forces the yeast to the top, whereas in the fermentation of lager the lower temperature allows the yeast to settle to the bottom. I am, of course, using popular terms.

The CHAIRMAN. We wish you to do that, so that we may understand it.

Mr. WYATT. Now, the true beer yeast will work under certain conditions of temperature while there is any free sugar—while there is any maltose sugar or grape sugar present in the wort with which the yeast is mixed, and it will cease directly that the fermentable sugar has disappeared. It breaks down or transforms, just as diastase does, and in the same way. Diastase acts on starch and transforms it into sugar. Yeast, one of its functional products, acts on sugar, decomposes it into practicably equal parts of carbonic-acid gas and alcohol. The carbonic-acid gas goes off; the alcohol, or the main portion of it, remains in the beer.

Science to-day has made so much progress that really scientific brewers—of course, there are few of them, but those that are not scientific themselves can get the aid of scientists to assist them, and generally do—science, as I say, has made so much advance to-day that it can predict with absolute certainty what kind of beer can be produced from any certain mashing process. So that if a brewer wants a beer of 3 per cent of alcohol, he can prepare his mash in such a way as to insure that when that is down to the required temperature and mixed with yeast, providing no foreign element is present; providing he is using a pure culture of yeast, that yeast will ferment the sugar present and produce 3 per cent of alcohol.

Therefore it would be perfectly feasible to make a law regulating the degree of fermentation. Perhaps I am anticipating myself. I will come back to that.

When the yeast has finished its work in the fermenting room proper, which takes about ten to thirteen days, it is allowed to settle to the bottom, and, when it has subsided, the thoroughly fermented beer, which now has been denuded to about 55 per cent of its original gravity—if it originally weighed 12, for example, it now weighs probably 5 or $5\frac{1}{2}$ on the calorimeter, which is put into the beer by the brewer, its temperature being reduced at this time.

As soon as the fermentation is ended, the aim of the brewer is to reduce the temperature to a point at which bacteria or foreign organisms will not work. The beer is then sent to the storage cellar, which is a room generally kept at a temperature of 33° or 34° F., and the beer is allowed to remain in that cellar until it is practically brilliant—until all the yeast has deposited—until all the albuminoids have been deposited.

Then at the end of about six weeks, which makes about two months

that the fermentation continues, the beer is brought into what is known as the chip-cask cellar, and it goes into the chip casks. There it is treated with a small quantity of fresh beer. In order to impregnate it with carbonic acid gas it is generally bound under sufficient pressure to give about $6\frac{1}{2}$ or 7 pounds, or one-half an atmosphere, because, of course, the carbonic-acid gas is absorbed in direct proportion to the temperature of the pressure, and it has been found from general practice that about a half of an atmosphere is sufficient pressure with which to saturate the beer with gas.

The CHAIRMAN. About half an atmosphere?

Mr. WYATT. Yes; about 7 to $7\frac{1}{2}$ pounds. Then, when the beer is perfectly brilliant—when the fresh beer that has been added to the old beer has completely fermented itself out and no further evidence of cloudiness appears—it is passed through a filter into the trade package and sent out to the trade, the whole process occupying now about two and a half to three months.

That, I should say, is the process carried on by 95 per cent of the brewers of the United States.

There are some brewers who have been lately considering what science has been trying to impress upon them for a long time—the fact that when the beer has been thoroughly fermented down to the desired point in the fermenting room, longer storage becomes superfluous. It has been proved to a demonstration that no further fermentation takes place in the storage cellar and that the only thing that does take place is a deposition of yeast and other suspended matters in the beer and reduction to a cold temperature.

Now, modern mechanical appliances have enabled us to reduce the temperature of the beer immediately after its fermentation to any desired point. The ice machine has done that for us, and we can by filtration eliminate all the impurities, and so some Europeans have adopted systems of fermentation and of elimination which enable them to put their beer on the market in a very much less period of time—less than three months.

It is impossible to distinguish by any means that science has placed at our disposal between the beers produced in this way and other beers. But a popular cry has been raised, based upon prejudice, I think, principally against putting upon the market an “immature” beer.

It has been my object for a great many years to find out what is meant by the term “immature beer,” and I am extremely anxious that in any legislation that is decided upon in this matter some provision should be made with regard to the degree to which a beer should be fermented, because a mature beer can be nothing else than a properly fermented beer—a beer which will not rapidly undergo decomposition when taken from a warmer temperature and put into a colder temperature. Therefore, as I say, the clamor that has been raised against these beers of comparatively short duration of fermentation is undoubtedly based upon prejudice and not upon any facts which warrant their being denounced. This is merely an expression of my opinion, and without any prejudice one way or the other.

The CHAIRMAN. You are convinced that beer, when thoroughly matured—that is, if it is fermented properly—is ready for consumption at any time after it is matured?

Mr. WYATT. Yes. I think I can make you understand it in this way. We can so arrange our mashing process—that is, the preliminary preparation of the work which makes the beer—as to have any desired

quantity or proportion of fermentable sugar present. We can use a yeast which will ferment that sugar and stop its action when so fermented. That beer is then in the condition that it would be if you took it away and put it in storage for six months, because no further fermentation takes place.

The CHAIRMAN. And the aging of the beer adds nothing to its value for consumption?

Mr. WYATT. No; for this reason: If it were wine or a stock ale, or any beer which could be kept at a very warm temperature, I might be disposed to consider the possibility of an oxidation of the alcohol into ether, and thereby a considerable gain in flavor and in most of those qualities which are acceptable to wine drinkers and ale drinkers. But in the case of lager beer we transfer the fermented beverage from a warm atmosphere to a cold atmosphere, which arrests all possible further chemical change. Now, there are some wild yeasts which are very undesirable, but which often get into our beers, which will act at very low temperatures, but those are the very things that we want to avoid. Therefore, that would be an argument rather against the storage of beer in a cold temperature for a great length of time. So that long storage of beer may be regarded as an exploded fallacy.

I think there are very few brewers to-day who have not abandoned the old-time theory of brewing their beers in winter and selling them in summer, and thereby keeping them in storage for eight or nine months. Those were the times when the adulterations or sophistications of beer probably took place. They were obliged to apply correctives in order to destroy the acidity of the beers.

The CHAIRMAN, I think one witness testified before the committee that in the long storage of perfectly matured beer the tendency was to increase the alcohol and decrease the malt extract.

Mr. WYATT. Well, that witness testified according to his light, but he was not correct. The constitution of the wort and the nature of the yeast employed are the two factors which determine their greater alcoholic strength or greater residual extract. The general taste in this country, as I stated in my opening sentences, is now for beer with very little alcohol and very much residual extract.

The CHAIRMAN. And then there is to be taken into account the aesthetic consideration—most people like to see their beer light?

Mr. WYATT. Yes.

The CHAIRMAN. Upon the question of preservatives or antiseptics—speaking now of barreled beer—do you know of any general custom in this country of using antiseptics like salicylic acid, or anything of that kind, for the purpose of preserving beer, or any other thing used for preserving it?

Mr. WYATT. Well, there are two very important branches of the consumption of malt liquors: One is consumption by what we call the draft trade, the other the bottling trade or the bottle trade.

Now, in my opinion, in fact I may say that, to my knowledge, there is practically no antiseptic of any kind used in beers destined for draft purposes, excepting where beers are shipped from one end of the continent to the other, as they sometimes are, and where they are liable to be exposed to severe and sudden changes of temperature. In those cases it has been customary, and I have advised brewers to use some small proportions of salicylic acid, that being, in my opinion, the least harmful of the antiseptics, so far as I know. I am not giving my opinion as a physiologist; but so far as I have been able to find out, through a careful examination of the literature of the subject, I regard sali-

cyclic acid as the most harmless of any preservative that can be used. Now, the actual amount in which salicylic acid is used may be stated broadly at about 1 part in 5,000, which represents a little less than half an ounce per barrel of 31½ gallons. That amounts to saying about one-quarter of a grain of salicylic acid per glass of beer.

The CHAIRMAN. Your judgment is that it would be one-quarter of a grain per glass?

Mr. WYATT. It is 1 gram in 5,000 grams of beer, or two-tenths of a gram per liter.

The CHAIRMAN. Have you, in the course of your business, had occasion to analyze imported ales and beers and wines?

Mr. WYATT. Yes.

The CHAIRMAN. Have you found the presence of preservatives there?

Mr. WYATT. Almost invariably.

The CHAIRMAN. That is just what you would do, I suppose, if you were shipping from here to a foreign port?

Mr. WYATT. Absolutely.

The CHAIRMAN. What is this preparation of lime that is used?

Mr. WYATT. Bisulphite of lime. That is an admirable antiseptic, much better than salicylic acid, because it has been definitely shown to be without any injurious effect whatever by a long series of experiments, extending over a long series of years, in England. But the objection to the use of bisulphite of lime in our beers is that none of our people will drink bisulphite beers. We have tried it. It may be owing to some fault in the treatment of our hops, or the manufacture of our material, or in the composition of our water supply. Undoubtedly our bisulphite decomposes into sulphureted hydrogen and other by-products, and the people do not care to drink sulphureted hydrogen. There used to be a name given to the smell of Bass's ale, of Burton-on-Trent. They spoke of it at one time as the "Bass stink." People would say, "I do not believe this is Bass's ale; it has not got the Bass stink." That "stink" was communicated by the bisulphite of lime, which was part of the manufacture. In Allsopp's and all the other ales imported I have found sulphurous acid, which leads me to believe that bisulphite of lime was used.

The CHAIRMAN. Have you ever found it in such quantities in any of the beers that you would consider it deleterious to public health?

Mr. WYATT. Never.

The CHAIRMAN. Do you know of any other preservative used?

Mr. WYATT. None, save salicylic acid and bisulphite of lime, used directly in the beer. I have heard of various antiseptics being proposed to brewers, and have invariably denounced them both in print and orally. Just now I said that I was absolutely in favor of using antiseptics, but I wish to be understood as saying that I only advocate the use of antiseptics when it is absolutely necessary for the preservation of the beer.

The CHAIRMAN. Where it is to be kept for a long time and shipped to varying climates?

Mr. WYATT. Yes. I think it is perfectly fair to say that the great majority of our breweries never use salicylic acid, never having a pound of it in their place—those who do not do a shipping trade.

The CHAIRMAN. The usual manner of preserving beer is by pasteurizing the bottled beer, as it is called?

Mr. WYATT. That is the most scientific and philosophical way.

The CHAIRMAN. As well as the most economical?

Mr. WYATT. Well, hardly economical. I will explain why.

The CHAIRMAN. Owing to the expense of boiling it in the bottle?

Mr. WYATT. And the breakage of the bottles. Because all liquors expand with heat, and if the bottles are filled too full (and it is desirable to leave as little air as possible in the bottle) the bottles break. One cause of beer deteriorating is attributable to the presence of either yeast or some other organism capable of fermenting the beer as soon as it comes to a proper temperature. If we could devise means of preventing that, it would be better; and so we pasteurize it up to a certain temperature at which most of the germs are killed. The unfortunate thing, however, is that dealing with practical men it is almost impossible to get them to understand that some germs resist temperature at 140°. Some beer has to be heated to 150 and some to 155. The consequence is that in the pasteurizing of beer the aim in this country is to keep the pasteurizing down as low as possible, and take the minimum of—say 140° Fahrenheit. There are certain germs in the beer that are not paralyzed at a heat of 140°, and it is to get at those that this minute quantity of salicylic acid is put into the beer.

The CHAIRMAN. How do these germs get in—from the air?

Mr. WYATT. They come from the air.

The CHAIRMAN. You did not hear the evidence given here yesterday, did you?

Mr. WYATT. I was not here yesterday.

The CHAIRMAN. There was some discussion as to the filtering of air, or having the fermentation take place in a vacuum. It was said that some experiments had taken place in that respect.

Mr. WYATT. Yes; I believe that some very exhaustive experiments have been made. All those things are very desirable if we could get them on a practical basis, where rough men with heavy fingers could handle them. When we get to a point where trained scientists may superintend these things, improvements can be and will be made. But unless properly attended to they become a curse rather than a blessing.

The CHAIRMAN. What is the process of filtering the air for?

Mr. WYATT. To draw the air through some substance which will offer no resistance to the passage of the air, but will prevent anything, such as germs or particles of dust, going through. Therefore we have selected cotton wool, and we generally mix that with a little glycerin to keep it from drying up.

The CHAIRMAN. And you draw the air through that?

Mr. WYATT. Yes.

The CHAIRMAN. In that way you keep away the unhealthy germs?

Mr. WYATT. You keep away everything but the yeast itself. But it is a very difficult thing to provide against an increase of these multitudinous armies that are always hovering around, because after everything is sterilized, and just at the very last moment, at the instant of putting the bung into the beer, we expose only a small space and the germs get in and undo all the work that we have been trying to accomplish.

The CHAIRMAN. There never has been any successful experiments in pasteurizing the beer in casks?

Mr. WYATT. Never. Much money has been spent, and many ingenious mechanical devices invented, but the beer has never been made satisfactory. It is easy to make it sterile, but we make it flat at the same time, and impart a foreign and distasteful odor and taste to it, and it is entirely unsatisfactory up to the present time in this country.

The CHAIRMAN. Let me inquire, in case you should use any cereal that was infected with disease, whether the process you describe would destroy that disease?

Mr. WYATT. Certainly. In the first place, the wort resulting from the mashing process—that is, the process in which the cereals and malt and all are mixed together with water at certain temperatures—that wort is boiled for periods varying from two and a half to three hours. It is a strongly acid solution, due to the acid phosphates present in the malt. It is also boiled in the presence of hops. I assume, Mr. Chairman, that by "diseased" you mean moldy or musty or deteriorated material.

The CHAIRMAN. Yes. I suppose it is possible to have diseases, such as fevers and things of that sort, that might attack the human system, existing in the cereal if it has been improperly handled?

Mr. WYATT. Yes. The same argument exactly will apply to every conceivable thing.

The CHAIRMAN. I hand you here what purports to be a standard of different beers—lager beer, export beer, bock beer, ale, porter, and condensed beer—

Mr. WYATT. Condensed beer?

The CHAIRMAN. It is called condensed beer in this list.

Mr. HUPFEL. Malt extract, I suppose, is what is meant.

Mr. WYATT. Yes; I suppose so.

The CHAIRMAN. That is supposed to be the standard fixed by Dr. Gustav Rupp, a German chemist. I will ask you, first, if you do not think—I believe you said you do think—there should be some fair regulation as to the fermentation that beer should undergo, as to the amount of alcohol that it should contain?

Mr. WYATT. Not necessarily. I say that the only possible—in my opinion, and I have looked at this matter for the last ten years from all possible sides that my intelligence would permit—no regulation is possible except one that establishes a degree of fermentation, a regulation which should say that no beer should be sold except, at the lowest, a degree of fermentation of 55 per cent, and no ale at less than 60 or 65 per cent. That is a matter that can be readily arranged for. If you say that beer shall be made of a certain specific gravity, then you are forcing certain persons to drink beers of a kind different from that which they want. But you can say that whatever the gravity of the beer, it shall have a certain degree of fermentation.

The CHAIRMAN. I understand that.

Mr. WYATT. I want to get over these difficult questions of souring and maturity and so forth. Let the brewer make beer of any gravity he pleases, or any that his customers require, but insist that the beer shall have a certain degree of fermentation.

The CHAIRMAN. Let me see if I understand the question. I can understand what you mean if you say that each barrel of beer shall contain a certain percentage of extract of malt. Would you have any regulation of that kind?

Mr. WYATT. Yes; that is practicable—say that every beer shall contain 45 per cent of its original gravity in extract. That is the same as saying that it shall have fermentation of 55 per cent.

Mr. HUPFEL. You mean to say, Doctor, that if beer will weigh 15 per cent in "kaiser," then when fermented it should weigh 45 per cent of that?

Mr. WYATT. No; I do not mean to say its apparent fermentation, but

its real fermentation. If we should take its apparent fermentation it would come out at about 8 or 9 per cent. I mean its real fermentation. In other words, a beer at 15 per cent "Kaiser" will come out at about 6, which is what it does now—55 per cent of real fermentation.

Mr. HUPFEL. Then if you should be brewing beer at 10?

Mr. WYATT. It would come out at 2 or 2½.

Mr. HUPFEL. That would be a "prohibition bill," would it not?

Mr. WYATT. That is right.

I have no objection to this schedule entitled "Chemical combination of standard beers." I think, however, it would be as absurd to attempt to establish these standards as it would be for the farmer to say to his grain when he puts it in the soil, "You shall grow 6 inches and no more," because the yeast is what determines the composition of the beer, the fermentation. He says here that lager beer shall have 3.93 per cent of alcohol.

The CHAIRMAN. Practically 4 per cent.

Mr. WYATT. Yes; we might have 4.03 or 4.04 or 3.09 and we should not be within that standard regulation.

He says also here that the extract should be 0.71 of the albuminoids. Now, we do not want so much albuminoids as that; ours are 0.04 or 0.05, because the materials that we use will not give that amount of albuminoids; and the brewer who wanted that would be obliged to put artificial albuminoids into his stock. With all that, these are perfectly fair averages of our own beer to-day, and, looking at these tables broadly, I should say that they represent tolerably well the beers produced in this country.

The CHAIRMAN. Do you know what the German law is, or whether there is a fixed standard of beer there?

Mr. WYATT. I think not; I do not know of any. I know that the Bavarian law was made for fiscal purposes, prohibiting the use of anything but malt and hops.

The CHAIRMAN. Yes, I understand that; because they get their revenue on that basis.

Mr. WYATT. Yes.

The CHAIRMAN. But you do not understand that even in Germany where they are particular about that, there is any standard?

Mr. WYATT. There are certain standards affecting its sale.

The CHAIRMAN. But is there anything that requires that there shall be a certain amount of malt extract, and so forth?

Mr. WYATT. No; I have never heard of any.

The CHAIRMAN. Now, in the pursuit of your profession and in the course of your experience you have analyzed a good deal of wine, have you not?

Mr. WYATT. Yes; large quantities of wine.

The CHAIRMAN. Did you find some adulterations in them?

Mr. WYATT. Lots.

The CHAIRMAN. I wish you would tell the committee briefly, as briefly as you may find consistent with its importance, some of the adulterations which you found in the wine.

Mr. WYATT. The chief adulterations I found in the wine have been aniline dyes—adulterations of the red wines.

The CHAIRMAN. The aniline dyes are the product of coal tar?

Mr. WYATT. Yes. They are used for the purpose of giving certain degrees of color.

The CHAIRMAN. Used for coloring the red wines?

Mr. WYATT. Yes. And the other sophistication that I find in red wines—for it is a sophistication and not an adulteration—is alcohol; they are generally fortified by the addition of alcohol.

The CHAIRMAN. And they can add water?

Mr. WYATT. No; it is not necessary. No; I think, on the contrary, they put alcohol in in order to act as a preservative. That is to say, that a wine which, fermented in the ordinary way, would yield 7 or $7\frac{1}{2}$ per cent of alcohol would have sufficient alcohol added to it to bring up the percentage to 10 or 11 per cent, which of course makes it a very strong wine. But the most reprehensible practice is the addition of the coloring matter, and that is the one which I have principally found—coal-tar compositions.

The CHAIRMAN. Are those used for any purpose except to color the wine red?

Mr. WYATT. Well, they produce various shades of color. There are some wines that come from Italy with a bluish-red shade; others with a port-wine shade. All these can be imitated now by the use of these artificial dyes.

The CHAIRMAN. You consider those not only sophistications but deleterious to public health?

Mr. WYATT. They are becoming less so now, because the aniline dyes can be prepared without the use of arsenic. At one time they were almost always compounds of arsenic and they were deemed by medical men objectionable on those grounds.

The CHAIRMAN. But by later processes—

Mr. WYATT. By later processes they are making them without any deleterious substance whatever. Consequently things are improving in that respect. They are used now to enable wine growers abroad to sell to wine importers in this country as certain brands certain other brands.

The CHAIRMAN. That is sophistication, is it not?

Mr. WYATT. Yes; that is sophistication.

The CHAIRMAN. It would be sophistication if I should sell Smith's wine, which is worth 50 cents a bottle and has no reputation, for Jones's wine, which is worth \$3.50 a bottle?

Mr. WYATT. That is sophistication.

The CHAIRMAN. But by the use of these things the cheaper wine is made to appear the better wine?

Mr. WYATT. Yes; it gives the color.

The CHAIRMAN. In the ales and porter that you have examined, have you ever analyzed any, either foreign or domestic, that showed the presence of anything that you considered deleterious to public health?

Mr. WYATT. Never.

The CHAIRMAN. Do you know, of your own knowledge, experience, or information, that any of the brewers of this country used aloes or any substitute for hops or malt that would, in your opinion, be unhealthful?

Mr. WYATT. Absolutely not. I have never met any. I have never heard of any. The only thing, as I said before, is the rumors that have come through the press. I have read articles in the newspapers charging brewers with using them, but I think they are purely imaginary, as I have never been able to trace them down.

TESTIMONY OF FRED. C. WACKENHUTH.

FRED. C. WACKENHUTH, sworn and examined.

The CHAIRMAN. What is your business?

Mr. WACKENHUTH. I am a brewer.

The CHAIRMAN. How long have you been engaged in that business?

Mr. WACKENHUTH. About thirty years.

The CHAIRMAN. Where is your residence?

Mr. WACKENHUTH. Newark, N. J.

The CHAIRMAN. What concern are you connected with?

Mr. WACKENHUTH. The firm of Ballantine & Co., Newark, N. J.

The CHAIRMAN. In what department of the work are you engaged?

Mr. WACKENHUTH. I supervise the work.

The CHAIRMAN. Do you do the brewing?

Mr. WACKENHUTH. Yes.

The CHAIRMAN. Do you do the buying?

Mr. WACKENHUTH. Yes.

The CHAIRMAN. You see what goes into the beer?

Mr. WACKENHUTH. Yes.

The CHAIRMAN. What is the capacity of your brewery for manufacture?

Mr. WACKENHUTH. Four hundred thousand barrels a year.

The CHAIRMAN. What do you make your beer of?

Mr. WACKENHUTH. Malt, some cereals, hops, water, and yeast.

The CHAIRMAN. Do you make it just in the usual way of manufacture—the method customary in the manufacture of beer in this country, so far as you know?

Mr. WACKENHUTH. About the same.

The CHAIRMAN. By the use of some cereals?

Mr. WACKENHUTH. In place of malt; more as an adjunct to malt.

The CHAIRMAN. Do you use preservatives?

Mr. WACKENHUTH. Yes; sometimes only.

The CHAIRMAN. On what occasions?

Mr. WACKENHUTH. In the height of the season—the summer time and for bottling beer only. We use it about five months in the year.

The CHAIRMAN. What do you use?

Mr. WACKENHUTH. Salicylic acid.

The CHAIRMAN. Are you a chemist?

Mr. WACKENHUTH. No, sir.

The CHAIRMAN. You have served your time as an apprentice to the brewing business?

Mr. WACKENHUTH. Well, no; I was raised in the business, so to speak.

The CHAIRMAN. Are you a brewmaster, or do you have a brewmaster besides yourself?

Mr. WACKENHUTH. No; I have that position myself. I have some assistants.

The CHAIRMAN. The object of this inquiry is to ascertain, if we can, what, if any, of the food products are adulterated and sold to the people that are deleterious to public health. You have stated practically all that you use in the manufacture of your beer?

Mr. WACKENHUTH. Yes.

The CHAIRMAN. And you consider everything that you use is perfectly sound and healthful?

Mr. WACKENHUTH. Yes; I do.

The CHAIRMAN. And proper to be used, do you?

Mr. WACKENHUTH. Yes.

The CHAIRMAN. You would not be afraid to drink it yourself?

Mr. WACKENHUTH. I do drink it myself at times.

The CHAIRMAN. And your friends do the same?

Mr. WACKENHUTH. Yes.

The CHAIRMAN. I have asked quite a number of gentlemen who have been on the stand their opinion as to the passage of a national law fixing a standard of beer. In your opinion, could that be done to operate fairly?

Mr. WACKENHUTH. I think it would be pretty hard to do it.

The CHAIRMAN. Men can make beer of any standard they please?

Mr. WACKENHUTH. We can make it so that it will be palatable to the trade. That is what we are governed by.

The CHAIRMAN. By the demands of your customers?

Mr. WACKENHUTH. Yes.

The CHAIRMAN. Some like a dark beer and some like a light beer?

Mr. WACKENHUTH. Yes; and some like a hop beer and some like a sweeter beer.

The CHAIRMAN. In your opinion, so far as you see now, you do not see any way in which a national law could be framed so that it would guide and direct and control the standard of beer to be made in this country?

Mr. WACKENHUTH. I do not.

The CHAIRMAN. In the coloring of beer, for instance, there are practically two standards of color, light and dark, are there not?

Mr. WACKENHUTH. Well, I would not say that. There are various colors, or, rather, variations in the color. We have four colored beers—very pale, export beer, lager beer, and dark special, four distinct colors.

The CHAIRMAN. So that if you had a standard you would have to have four different standards for the four different colors?

Mr. WACKENHUTH. Certainly.

The CHAIRMAN. What, if any, coloring matter do you use?

Mr. WACKENHUTH. We use caramel malt and burnt malt.

The CHAIRMAN. The burnt malt makes a darker-appearing beer.

Mr. WACKENHUTH. Yes.

The CHAIRMAN. And the caramel malt is not so black?

Mr. WACKENHUTH. No, sir.

TESTIMONY OF EDWARD G. ROCHE.

EDWARD G. ROCHE, sworn and examined:

The CHAIRMAN. Where do you live?

Mr. ROCHE. In New York City.

The CHAIRMAN. What is your business?

Mr. ROCHE. I bottle Bass's ale and Guinness's stout.

The CHAIRMAN. You are connected with Mr. Heywood C. Broun, who was on the stand before?

Mr. ROCHE. Yes, sir.

The CHAIRMAN. You understand the scope of this investigation without my repeating it—you have heard it repeated here?

Mr. ROCHE. Yes.

The CHAIRMAN. What suggestions have you to make to the committee on the subject?

Mr. ROCHE. None that I know of.

The CHAIRMAN. When you bottle your goods—you do not manufacture them?

Mr. ROCHE. No; we receive them; we import them as they come from the brewery, and we put them in the bottle without the addition of any adulterant or preservative, absolutely.

The CHAIRMAN. It comes to you in casks?

Mr. ROCHE. It comes to us in casks, and it undergoes a fermentation after being put into the bottle, which strengthens it in alcohol and also in carbonic acid.

The CHAIRMAN. It undergoes a fermentation after being put in the bottle?

Mr. ROCHE. Yes.

The CHAIRMAN. Is that the usual way of bottling ale and stout?

Mr. ROCHE. Yes; I think so.

The CHAIRMAN. Is it not fermented before being bottled?

Mr. ROCHE. It is fermented, but at the same time there is enough fermentable matter left in it, with the addition of secondary yeast, to cause a further fermentation in the bottle.

The CHAIRMAN. Then do you add any yeast to it?

Mr. ROCHE. No.

The CHAIRMAN. You add nothing to the cask as it comes, but you put the material in the bottle just as it comes to you?

Mr. ROCHE. Just natural fermentation.

The CHAIRMAN. You use no antiseptics?

Mr. ROCHE. No.

The CHAIRMAN. Nothing of the kind?

Mr. ROCHE. Nothing of the kind.

The CHAIRMAN. Did you hear the evidence as to certain goods being sold in this country in bottles and the question of forging labels?

Mr. ROCHE. Yes; that is done in innumerable instances. I suppose our brand has been infringed upon in the last ten years a thousand times.

The CHAIRMAN. Have you had any trials or convictions for the offense?

Mr. ROCHE. Yes; a half a dozen of them.

The CHAIRMAN. Have you any suggestions to make to the committee as to the way in which the Government might protect itself or the honest dealer?

Mr. ROCHE. Nothing, except that the Government should protect its copyright law—to give a guaranty to users of the copyright to do a safe business.

The CHAIRMAN. When they put these forged labels on the bottles, they substitute American ales for imported ales?

Mr. ROCHE. In every case.

The CHAIRMAN. And in that way they get the benefit of catering to what might be called the Anglo-American taste, which thinks there is nothing good enough for them made in this country, and so get what they suppose to be an imported article without paying the duty to the Government.

Mr. ROCHE. Yes.

The CHAIRMAN. And in that way they wrong you, who have to pay the duty?

Mr. ROCHE. Yes; doubly so.

TESTIMONY OF HENRY HACHEMEISTER.

HENRY HACHEMEISTER, sworn and examined.

The CHAIRMAN. Where do you live?

Mr. HACHEMEISTER. At 154 East Forty-sixth street, in this city.

The CHAIRMAN. What is your business?

Mr. HACHEMEISTER. I am treasurer of the firm of George Ringler & Co.

The CHAIRMAN. What is their business?

Mr. HACHEMEISTER. Brewers of lager beer.

The CHAIRMAN. You are the treasurer of the company. Do you give your time to the business in connection with the manufacture of beer?

Mr. HACHEMEISTER. I do.

The CHAIRMAN. Are you familiar with the manufacture of the product known as beer in this country?

Mr. HACHEMEISTER. I am.

The CHAIRMAN. You know generally what it is made of?

Mr. HACHEMEISTER. I do.

The CHAIRMAN. This committee is seeking information to give to Congress on the question of adulterations of food and drink—first, adulterations injurious to the public health, and secondly, that form of adulteration that results in a sale to the consumer in fraud of his natural rights—selling him what he does not intend to buy or know that he is buying. First, as to those adulterations that are injurious or deleterious to health, let me inquire, do you use any preservatives in your beer?

Mr. HACHEMEISTER. No, sir.

The CHAIRMAN. How do you preserve your bottled beer?

Mr. HACHEMEISTER. In the brewing. We do not preserve it at all. We do not use anything.

The CHAIRMAN. You adopt the pasteurizing process, I suppose.

Mr. HACHEMEISTER. We simply steam our beer—some of it.

The CHAIRMAN. What part of it do you steam?

Mr. HACHEMEISTER. The part, for instance, that is to be shipped—that is, to be sent out of town, or perhaps delayed some time.

The CHAIRMAN. To what degree do you heat that?

Mr. HACHEMEISTER. I am not very familiar with the bottling department, and I do not know.

The CHAIRMAN. That is what is called steaming or pasteurizing the beer?

Mr. HACHEMEISTER. Yes.

The CHAIRMAN. So as to keep it from fermenting?

Mr. HACHEMEISTER. Yes.

The CHAIRMAN. Do you use anything besides hops and malt to make the beer?

Mr. HACHEMEISTER. Some corn.

The CHAIRMAN. Do you use any glucose?

Mr. HACHEMEISTER. No glucose.

The CHAIRMAN. Why do you use corn?

Mr. HACHEMEISTER. I believe it is to make the beer lighter—to make a light-brew beer.

The CHAIRMAN. Does it suit your trade better than an all-malt beer?

Mr. HACHEMEISTER. I believe it does; otherwise we should not brew it.

The CHAIRMAN. And it is cheaper than all-malt beer to manufacture, is it not?

Mr. HACHEMEISTER. It might be a trifle; I do not know that it makes much difference.

The CHAIRMAN. Do you think, from what experience you have had in this business, that there could be a national law passed which would fix a standard of beer for the whole United States?

Mr. HACHEMEISTER. I think so. I do not think it would be fair to pass a State law, though.

The CHAIRMAN. Because your competitors in adjoining States would have advantages which you would not have here?

Mr. HACHEMEISTER. Exactly.

The CHAIRMAN. You think it would be an advantage to the honest brewers to have a uniform law or standard provided which would apply to all the States of the Union?

Mr. HACHEMEISTER. I do.

The CHAIRMAN. And not to apply as against the brewers of any one State?

Mr. HACHEMEISTER. Exactly.

TESTIMONY OF ROBERT W. EVANS.

ROBERT W. EVANS, sworn and examined:

The CHAIRMAN. What is your business?

Mr. EVANS. I am a brewer of ale and porter.

The CHAIRMAN. In this country?

Mr. EVANS. Yes.

The CHAIRMAN. Will you tell the committee the difference, briefly, between beer, as it is called, and ale?

Mr. EVANS. Well, ale is brewed with top fermentation and not in cold storage. Porter is the same, only it is brewed with roasted malt.

The CHAIRMAN. That gives it the black appearance?

Mr. EVANS. Yes—like roasted coffee.

The CHAIRMAN. The only difference between the beer and the ale is in the process of brewing; as I understand it, the fermentation takes place, in the case of ale, with the yeast on top.

Mr. EVANS. Practically that.

The CHAIRMAN. And that in the beer it settles in the bottom?

Mr. EVANS. Yes.

The CHAIRMAN. What do you use in making ale?

Mr. EVANS. Malt and hops.

The CHAIRMAN. And the same with porter?

Mr. EVANS. Yes.

The CHAIRMAN. You manufacture both ale and porter?

Mr. EVANS. Yes.

The CHAIRMAN. Where is your factory?

Mr. EVANS. At Hudson, N. Y.

The CHAIRMAN. Do you use any cereals besides hops and malt?

Mr. EVANS. Sometimes.

The CHAIRMAN. What do you use?

Mr. EVANS. Corn.

The CHAIRMAN. If you use corn, you have to use less barley malt, as I understand it?

Mr. EVANS. Yes.

The CHAIRMAN. And you use corn that has never been malted—unmaltered corn?

Mr. EVANS. Yes.

The CHAIRMAN. Do you personally see what goes into the manufacture of beer?

Mr. EVANS. I do not.

The CHAIRMAN. You are not the brew master?

Mr. EVANS. I am not a practical brewer.

The CHAIRMAN. Do you know from personal observation what goes into your goods?

Mr. EVANS. I do.

The CHAIRMAN. Do you know what is bought to go into them?

Mr. EVANS. I do.

The CHAIRMAN. Do you use any preservatives at all?

Mr. EVANS. No.

The CHAIRMAN. No acids—no salicylic acid?

Mr. EVANS. No.

The CHAIRMAN. Do you pasteurize the beer?

Mr. EVANS. We do not.

The CHAIRMAN. As I understand, it is expected that ale and porter will ferment some time after it is bottled. Is that so?

Mr. EVANS. Yes. Ale and porter do not spoil, as lager does, in shipping. Present-use ale, made for immediate consumption, and not particularly exposed, does not have a chance to spoil, so to speak, whereas stock ales are brewed with the idea of keeping at any amount of temperature.

The CHAIRMAN. How long will a bottle of ale or a bottle of porter keep?

Mr. EVANS. Indefinitely, after it has once been found right—when found in proper condition for the market.

The CHAIRMAN. How is it if it is ale in wood? How long would that keep?

Mr. EVANS. Stock ales, of course, are old ales. They may be sold at any time from eighteen months to eight years, according to the character of the goods; or less than that, of course.

The CHAIRMAN. When you say "stock" ales, what do you mean by that?

Mr. EVANS. A stock ale is an ale brewed with the idea of keeping, whereas present-use ale, so called, is brewed for immediate consumption. Present-use ales are marketed within a short time of brewing.

The CHAIRMAN. Does ale ever ferment in the bottle?

Mr. EVANS. Present-use ales are all fermented in the bottle. They are live ales.

The CHAIRMAN. Do you consider that the ingredients that you use in the manufacture of your goods are perfectly sound and healthful for public use?

Mr. EVANS. I do.

The CHAIRMAN. You do not know of anything that is put into them that is detrimental to public health?

Mr. EVANS. I do not.

The committee adjourned until to-morrow, Thursday, November 16, 1899, at 10.30 a. m.

COMMITTEE ON MANUFACTURES, U. S. SENATE,
IMPERIAL HOTEL, NEW YORK CITY,
Thursday, November 16, 1899.

TESTIMONY OF PROF. RUSSELL H. CHITTENDEN.

RUSSELL H. CHITTENDEN sworn and examined:

The CHAIRMAN. What is your profession and where is your residence?

Professor CHITTENDEN. I am professor of physiological chemistry in Yale University and director of the Sheffield Scientific School, New Haven, Conn.

The CHAIRMAN. Will you kindly state briefly what course of study you have pursued and what degrees you have taken, with the purpose of placing on record your preparation for the profession which you follow? And also please state what experience you have had.

Professor CHITTENDEN. I was graduated from the Sheffield Scientific School of Yale in 1875 with the degree of bachelor of philosophy. I studied physiology and physiological chemistry and allied branches at Heidelberg University in 1878 and 1879. I took the degree of doctor of philosophy at Yale in 1880 and have been professor of physiological chemistry at Yale ever since 1882. I am also a member of the National Academy of Sciences and president of the American Physiological Society.

The CHAIRMAN. Have you, in the course of your study and experience, had occasion to analyze food products in this country?

Professor CHITTENDEN. Ever since 1882—for the last seventeen years—I have been very much interested in all problems connected with the study of digestion and nutrition. In fact, that has been one of my special lines of work, and in that direction I have had occasion to study the action of a large number of substances with reference to their influences on digestion and nutrition and have had occasion to make analyses of various food products.

The CHAIRMAN. And have you given special attention to the study of the use of preservatives or antiseptics?

Professor CHITTENDEN. That has come in incidentally; in fact, I have studied a large number of substances which at the time were not in use as preservatives, but have become prominent since that time as such.

The CHAIRMAN. What are the usual preservatives used?

Professor CHITTENDEN. So far as my knowledge goes, the number is very large, of course, varying according to the character of the food product which is under consideration. Vinegar, acetic acid, common salt, various salines, borax, or sodium borate, boracic acid, salicylic acid and a great many others which I need not mention, perhaps.

The CHAIRMAN. I would like if you would give the committee the benefit of your opinion generally as to the use of antiseptics in food.

Professor CHITTENDEN. Summed up in a few words, I think that there are occasions and there are products where it is desirable at times to use preservatives, but I have the general feeling that it is exceedingly important that we should have some law or some method of control by which all food products of any kind to which preservatives have been added should have a label or some mark which would specify the nature or character of the substance added and the quantity of that substance added.

In other words, I do not believe that any general law which would exclude the addition of what you would speak of as poisonous substances would suffice, because I think it is a very difficult matter to find a body of men who will agree upon what constitutes a poison. I can perhaps illustrate my meaning, if I may speak more fully, by giving an illustration: Take, for example, the gastric juice; that is to say, the stomach juices upon which we all depend for the digestion of any food. One of the governing agents there is hydrochloric acid, which is present in the gastric juice to the extent of two-tenths of 1 per cent. That is perfectly harmless. It is an indispensable agent of digestion, and yet every chemist knows that hydrochloric acid or muriatic acid, as the chemist calls it, sometimes is one of the most poisonous substances in concentrated form.

So, again, with ordinary vinegar or acetic acid, which is a common preservative for articles of food, and has been in use for many years. In that form it is perfectly harmless, but in concentrated form it is one of the most violent of poisons. You can not conceive of anything more poisonous. So with many other substances which we use frequently as preservative agents or as additions to our food; they are perfectly harmless in small quantities, but when the quantity is increased become poisonous. In other words, it is a question of quantity. It is no question of the substance whatsoever.

I think you might say that that illustrates the general principle. It is hard to define what poisons are. Some of the most violent poisons are, in fact, in small quantities very judicious agents.

There is an old saying that every medicine is a poison and every poison a medicine. It is a question of quantity. In certain definite quantities we can not well say that all poisonous substances must be excluded, but we can insist upon a law which will compel the stamping on a label of this or that agent, which is added for this or that purpose, and the quantity; then we have something that may be controlled for the great benefit of the people.

The CHAIRMAN. Will you please state the difference between a poison and an antiseptic?

Professor CHITTENDEN. I do not think that one can well make a direct statement which would specify a difference. Many antiseptics are violent poisons when the quantity is sufficiently large. Hydrochloric acid, to come back to the old illustration, is an example; but of course if you increase the quantity beyond a certain point its antiseptic action would be manifest, but would also produce death if brought in contact with the living body, internally.

The CHAIRMAN. What is the action of antiseptics on food; what are they used for?

Professor CHITTENDEN. The primary object, as I understand it, is to prevent the growth and development of microorganisms. They do not necessarily kill the microorganisms which are ordinarily present, but they prevent their development, and consequently interfere with the production of poisonous products which would tend to contaminate the food.

The CHAIRMAN. It would also interfere, would it not, with digestion?

Professor CHITTENDEN. I do not think that that necessarily follows, but I think that as a rule antiseptics would interfere with such action if the quantity were sufficiently large. That varies with the individual bodies.

The CHAIRMAN. Have you ever examined any of the antiseptics sold for preserving milk, for instance? Have you seen any of those antiseptics put up in bottles?

Professor CHITTENDEN. No; I have never analyzed any of those. In fact, I know nothing of them except by hearsay.

The CHAIRMAN. We have had brought before our committee quite a number of antiseptics that are advertised under different names. In Chicago the thing called "formaldehyde" was brought in.

Dr. WILEY. Yes; it was called "Freezum."

Professor CHITTENDEN. I have heard of those things.

The CHAIRMAN. Do you think it wise that those articles should be permitted to be sold generally and indiscriminately among the people? Take formaldehyde, for instance. Do you think that dangerous?

Professor CHITTENDEN. I do not think that it ought to be used indiscriminately.

The CHAIRMAN. What articles of food have you analyzed that have conveyed or shown the presence of antiseptics?

Professor CHITTENDEN. I have analyzed very few that have shown the presence of antiseptics. Of course, in the course of the period I have mentioned I have had occasion to analyze a great many, but, after all, my special line of work has been rather in the line of studying the physiological effects of a variety of agents, some of which have come into prominence as preservatives.

I have analyzed some products, but most of those which have fallen into my hands have been free from impurities. I have analyzed some of the preserved beef, etc., for the United States Government, but with one exception they were all free from any additions. The only one which I can recall which had anything in the line of addition contained simply a large amount of common salt, with just a trace of niter—a very minute trace. It was practically the addition of salt.

The CHAIRMAN. Will you please describe the effect that the preservative has on the stomach?

Professor CHITTENDEN. That depends altogether on the nature of the substance which is meant by the word "preservative."

Alcohol, for example, is a good preservative. In some quantities alcohol, so far as can be measured by experimental evidence, has very little, practically no, injurious effect in small quantities. So far as the digestive processes are concerned it rather stimulates than retards the digestion so far as can be measured by experiment. Among common preservatives there is to be found ordinary salt, and in small amount that tends to increase the rate of digestion; but as the quantity of salt is increased you find that there is a falling off in digestive action. The salt tends to retard the solution of the food stuff; but still, if one is to give a thoroughly accurate answer to such a question, one must keep in mind that what we call digestion is the result of a variety of physiological processes. A layman thinks of digestion as one process, but it depends on the solvent action of a given quantity of the gastric juice and is modified by the rate of flow.

As you add a certain quantity of alcohol to a given quantity of stomach contents, you find that that quantity of alcohol in that given volume will retard the rate of digestion. It tends to slow the solvent action. But in the living stomach you have an increased rate of flow as the result of the alcohol, and one balances the other to a certain extent. In the living stomach a certain quantity of alcohol present does not interfere with the digestive processes. It has, on the other hand, physiologically speaking, made perhaps a greater drain on the body, because it has called forth an increased secretion of the gastric juice, which means increased labor on the part of the organism to produce that gastric juice.

Then the rate of digestion depends upon peristalsis. We all know the benefit of taking an after-dinner cup of coffee—that it improves our digestion. It does not increase or decrease materially the rate of solvent action, but it increases the peristaltic movements of the intestine, and in that way the rate of digestion is increased. So that there are a great many problems of that kind which really must be considered in attempting an answer to any such general question.

Of course there are agents like alcohol which, taken in large quantities, produce direct effect on the mucous membrane of the stomach by inflammation, etc., but that means more especially in large quantities.

So hydrochloric acid of the gastric juice belonging in the stomach does no harm, as two-tenths of 1 per cent; but 5 per cent would have a local inflammation at once. So, as I have said, quantity must always be taken into account in such cases and in such connections.

The CHAIRMAN. What is the effect on the stomach of the use of salicylic acid?

Professor CHITTENDEN. So far as my own observation and experience goes, there is almost invariable a retardation of digestion in the stomach.

The CHAIRMAN. It has a tendency to stop or paralyze.

Professor CHITTENDEN. I should say retard, rather. And it is said that the long-continued use of salicylic acid results in local effects, but of that I do not know.

The CHAIRMAN. Local effects—how?

Professor CHITTENDEN. Local effects on the mucous membrane; but I do not know by personal experiment as to that.

The CHAIRMAN. How is it with regard to borax? That is a matter that has been under discussion before the committee.

Professor CHITTENDEN. I have made a good many experiments with borax and boracic acid under varying conditions, and so far as it can be stated in a general way—I know that my own experiments indicate that small amounts of borax produce no measurable effect that could be spoken of as deleterious; in fact, very small amounts tend to increase, if anything, the rate of digestion. That is specially true of boracic acid as contrasted with borax. The base combined with the boracic acid and borax is in itself, I think, a little inclined to retard digestion, so that the boracic acid is not so active as the sodium borate or borax.

I have tried large number of feeding experiments on dogs, with reference not so much to digestion by itself as with reference to the combined or possible combined action of digestion and the other processes of nutrition; and where the quantities given are small there are no injurious effects that can be noted at all, but where the quantity given is large enough, if you push it to the limit, you find that there is produced a nausea and vomiting. That is the maximum effect that I have observed. The urine will frequently become alkaline with large quantities of borax, but not in small quantities.

The CHAIRMAN. Boracic acid is a product of borax?

Professor CHITTENDEN. Yes.

The CHAIRMAN. Is it changed in its formation—and how do you make it?

Professor CHITTENDEN. You simply separate it from the borax by simply withdrawing; that is, borax is sodium united with boracic acid, just as common salt is sodium combined with boracic acid or combined with the radical, the chlorine. You can take borax and separate boracic acid from it.

The CHAIRMAN. In the preservation of meats in this country generally we use which—boracic acid or borax?

Professor CHITTENDEN. That I do not know by any personal knowledge.

Dr. WILEY. In former years borax itself was almost exclusively used, where used at all. In the last few years boracic acid is largely coming into use instead of the borax, especially in preserving hams.

Professor CHITTENDEN. I may say that our Connecticut State board, or rather the agricultural experiment station, have made a number of experiments in which borax has been found, and I think boracic acid, but I think borax has been a little more prominent in those food products.

The CHAIRMAN. In such quantities as you have observed, did you consider it dangerous or injurious to the public health?

Professor CHITTENDEN. Not where I have seen it. I have heard of very large quantities being found, but in these analyses that have been reported at the agricultural experiment station in New Haven the quantities were almost all small. The percentages were small.

The CHAIRMAN. Do you think that one-half of 1 per cent of boracic acid in butter would be objectionable?

Professor CHITTENDEN. Not in my judgment; no.

The CHAIRMAN. I would like to get for the benefit of the committee your idea as to a national law to regulate the use of these preservatives or antiseptics.

Professor CHITTENDEN. My own opinion is that the best result would be obtained by a law which should compel the manufacturers to stamp upon the product the nature of the preservative used and the quantity of the preservative present, and that then there should be a commission or some one in authority to whom such products could be referred, with power in such matters.

The CHAIRMAN. What do you say as to the use of copper and zinc colors to give vegetables a green appearance?

Professor CHITTENDEN. My judgment there is that their use should be prohibited, because, as I understand it, there is nothing gained except to produce an effect which appeals to the eye purely. There is no question there of preservation or of correcting the possible injurious effects of microorganisms, but the custom is the addition of what we know to be a poisonous substance and the only effect produced, as I understand it, is to deceive the eye. In other words, I see nothing to be gained by the addition of such agents, and there is possible danger.

The CHAIRMAN. Then by or through this commission you would not only have marked the preservatives contained, but in some cases you would prohibit the use of a certain class of preservatives?

Professor CHITTENDEN. So-called preservatives which are well-known to be absolutely poisonous and dangerous, I think it would be wise to prohibit.

The CHAIRMAN. What food products have you analyzed?

Professor CHITTENDEN. I have analyzed canned meats; I have examined sausages and such products at various times, butters, milk, and various cereal products, various saccharine products, sugars, molasses, sirups, and things of that sort.

The CHAIRMAN. While on this point, take the question of sirups. Under the resolution authorizing this investigation we are asked to report upon such adulterants as are deleterious to public health and those that are mere sophistications, and on the question of sirups do

you know—have you observed, as a matter of fact—that sirups, for instance, maple sirup, are frequently made in large percentage of, say, glucose?

Professor CHITTENDEN. I have known of such cases.

The CHAIRMAN. And honey?

Professor CHITTENDEN. Yes.

The CHAIRMAN. We have many instances where honey has been brought before the committee—a thing marked honey, but which consisted to the extent of 80 or 85 per cent of glucose, and perhaps a little piece of honeycomb at the top. That would not necessarily be deleterious to health, but it is a fraud on the consumer.

Professor CHITTENDEN. It is unquestionably a fraud.

The CHAIRMAN. Do you not think that the law should also, in the interest of the consumer and to protect the honest manufacturer who sells his goods for what they are, that such goods should be marked for what they are?

Professor CHITTENDEN. I think so most decidedly. I believe—if I may state my belief—

The CHAIRMAN. Certainly; that is what I want.

Professor CHITTENDEN. I believe the glucose industry and the oleo-margarine industry are perfectly legitimate, but there should be a law which should compel the selling of those products under their proper names. In other words, the consumer, when he buys an article, should be so protected that he is buying what he asks for. If he wants honey, he should get honey, and not glucose. I think that could be done by compelling the articles in question to be labeled as their composition warrants.

The CHAIRMAN. Have you analyzed any beer?

Professor CHITTENDEN. Yes; I have analyzed a good many liquors of all kinds. I have been specially interested in the study of the influence of alcoholic fluids on digestion for the last three or four years, and have published quite a number of papers on the subject.

The CHAIRMAN. In the beers that you have analyzed—were they domestic beers?

Professor CHITTENDEN. Only domestic beers, with one exception. There was one imported beer.

The CHAIRMAN. Did you find in any of the beers that you examined any evidence of antisepsics or preservatives?

Professor CHITTENDEN. I did not in the samples that I analyzed. In fact, I may say that perhaps in all the various liquors which in the last five years I have had occasion to analyze the only well-defined impurity, if I can call it that, was the addition of water in whisky. I was very anxious to find out what possible adulteration might be in the whisky which one would find among the lower-class saloons, and, to my surprise, I found that, so far as my method of analysis would admit of showing, the custom seemed to prevail in some of the lowest grades of saloons of adding water to the whisky. Perhaps I ought to add that I found the presence of tannin also in some of the lower-grade whiskies—that is, low in the sense of having a less proportion of alcohol and a greater proportion of water. But whether that was the result of adulteration or of the presence of the product for a long time in bad casks I could not tell.

The CHAIRMAN. In those whiskies that you mention you say you found the presence of tannin, but, with that exception, it was usually adulterated with water?

Professor CHITTENDEN. That was the only evidence that I had of

adulteration. Perhaps I ought to add that I think it is questionable whether chemical analysis alone will always detect what you might call "made" whisky.

The CHAIRMAN. What is your idea of beer, Professor? Can you give us a definition?

Professor CHITTENDEN. My idea of beer is a malt product—a product of barley malt.

The CHAIRMAN. Would the substitution of other materials, in part use, still enable it to be denominated beer?

Professor CHITTENDEN. In my judgement, the substitution of bitter principles in place of hops would constitute an adulteration, but I am not perhaps posted on what would be considered legitimately an adulteration in beer. I look upon beer as a malt product and hop product and that the bitter principle should be hops. I do not know what the world in general think.

The CHAIRMAN. Would the substitution of other cereals, unbolted cereals, like rice or corn, in your opinion, be deleterious to health?

Professor CHITTENDEN. No; I think not. I see no reason why it should be.

The CHAIRMAN. Did you ever examine any unfermented grape juice?

Professor CHITTENDEN. No; I never did.

The CHAIRMAN. Do you think that an artificial whisky made by essences is as wholesome as a natural whisky made by aging?

Professor CHITTENDEN. I should think it very questionable. I do not think I could answer that definitely, because I do not know by any direct knowledge what the effect of some of these essences is upon the body.

The CHAIRMAN. Have you analyzed any extracts?

Professor CHITTENDEN. You mean vegetable extracts?

The CHAIRMAN. Extracts for flavoring foods.

Professor CHITTENDEN. I think not. I think I analyzed one or two so-called vanilla extracts some years ago; not of late years.

The CHAIRMAN. Have you had any occasion to analyze or examine any canned coffee?

Professor CHITTENDEN. Not that I remember now. I think not. I have analyzed coffee, but none of the canned coffee.

The CHAIRMAN. Nor tea?

Professor CHITTENDEN. No tea.

The CHAIRMAN. Have you examined any jellies?

Professor CHITTENDEN. I think not; not of late years.

The CHAIRMAN. There is evidence before the committee that jellies are made by simply using glucose or acetic acid or hydrochloric acid, or both. Would you consider that a proper and healthful thing to go into the human stomach?

Professor CHITTENDEN. I should think it would depend upon the quantity of the acid present. In my judgment, certainly such products should be labeled for what they are and not sold in any attempt to deceive the public.

The CHAIRMAN. Acetic acid is a very strong and dangerous article, is it not, to go into the human stomach?

Professor CHITTENDEN. It depends entirely on the quantity of the acid. What we ordinarily call vinegar is only diluted acetic acid, and it is a question of quantity, as I said before.

The CHAIRMAN. If it should be used to the extent of furnishing all the acid necessary in a mixture with glucose to make a thing taste like jelly, would you consider that injurious?

Professor CHITTENDEN. I think it very doubtful if it would be injurious to the body; but, as I said before, I think such products should be labeled for what they are and not sold for something else.

The CHAIRMAN. If that was the only acid, would you consider that if there was acid enough in, say, a pail of glucose, as it is described before this committee, and the only tart acid in it, or the only essence of sourness in it is what comes from this acid, stored up in the glucose—would you not think that if used in quantities enough to give it that jelly taste it would be almost too much to go into the human stomach?

Professor CHITTENDEN. I think the truth would compel me to say that the quantity which a person would ordinarily consume would probably be so small that the amount of acid mixed in might possibly not be injurious; but I do not think such products should be sold except under their own proper label, showing what they are.

The CHAIRMAN. You have given this subject of digestion long and careful study. Will you kindly name some of the articles which you consider improper to be sold for food that are being sold for food?

Professor CHITTENDEN. You mean as additions to food?

The CHAIRMAN. Yes; either as additions, or as the food products themselves.

Professor CHITTENDEN. I should say that such agents as you referred to some moments ago—sulphate of copper and salts of that kind which are used to color products—ought to be prohibited, for I see no possible occasion of their use as food products or as additions to food products. And I should question the propriety of the use of salicylic acid, and although I have very little knowledge of the action of formaldehyde, I am inclined to believe that that product is of rather questionable value in such mixtures. But, as I say, I have had no personal knowledge. I have never experimented sufficiently with formaldehyde to warrant me in making a definite statement.

The CHAIRMAN. Formaldehyde is a preparation from wood alcohol, is it not?

Professor CHITTENDEN. Yes. It is sold, of course, under a variety of names. The "freezum" spoken of a few minutes ago is essentially a formaldehyde product.

The CHAIRMAN. I am very much obliged to you, Professor, for giving us your time and attention, and if you have any suggestions which you would be willing to make to the committee I should be very glad to receive them, as they would undoubtedly be valuable to the committee, regarding any foods that are sold that ought to be marked differently from what they are.

Professor CHITTENDEN. What seems to be to me the one important point which I think I have perhaps emphasized sufficiently already is the great importance, as to all food products which contain additions, of having those products so stamped that they will show the nature of the substance added and the quantity of that substance which is present. That seems to me to be one of the very essential points for the protection of the community at large and one which ought not to be harmful to the manufacturers of such products.

The CHAIRMAN. Upon the question of the establishment of such standards of purity, or standards of safety, or standards of strength of food—do you not think that such standards could be established under a commission such as you suggested?

Professor CHITTENDEN. I think it could; yes. I think such a commission would be of very great value, of very great help, in establishing better conditions in all these respects.

The CHAIRMAN. Would you favor fixing a standard for everything that could be reasonably fixed?

Professor CHITTENDEN. Yes; so far as it can be done.

The CHAIRMAN. For instance, take beer. Would you favor a standard of beer?

Professor CHITTENDEN. I think it would be very desirable for at least a standard which might give a little leeway. I do not mean a standard fixed to an absolute point, because that would be impossible; but a standard which would be considered reasonable in the minds of reasonable persons of scientific knowledge.

The CHAIRMAN. And when adulterated below that point it should be known to the consumer?

Professor CHITTENDEN. Yes.

The CHAIRMAN. Here is a chemical combination of standard beers [exhibiting the paper to Professor Chittenden]. It is a standard which I am informed is or has been fixed by Prof. Gustav Rupp, that gives the percentage of alcohol and of extract of malt. Would you kindly look at that document?

Professor CHITTENDEN (after examining the paper). Of course I should want to study this in some detail in order to accept it in its entirety, but I think the principle embodied here is the right principle.

The CHAIRMAN. And the proportions would strike you as somewhat near what you consider a proper beer?

Professor CHITTENDEN. Yes, I think so. The quantity of alcohol, for instance, falls in with about my own experience in the analysis of ordinary beers. Condensed beer I have not analyzed.

The CHAIRMAN. That is a malt extract, I suppose?

Professor CHITTENDEN. Yes. That I have not analyzed.

The CHAIRMAN. The malt extract is the valuable thing in the beer?

Professor CHITTENDEN. From the nutritive standpoint it is.

The CHAIRMAN. And you think there should be some standard that would declare that?

Professor CHITTENDEN. I think that would be very valuable, yes. I think that probably a large number of analytical examinations would doubtless show that in the case of lager, for example, there should be some little margin for possible variation. That is, I do not think a single definite figure should be used unless it is stated that that should be a maximum or minimum.

The CHAIRMAN. Have you considered the best manner of preserving a beer to keep it from fermenting or keep the germs from working after it is bottled?

Professor CHITTENDEN. No; I have not given any thought to that matter.

The CHAIRMAN. You know what the pasteurizing process is, the boiling process?

Professor CHITTENDEN. Yes; I understand it.

The CHAIRMAN. And you think that the use of preservatives in beer, if used in proper quantities, would not be deleterious to health?

Professor CHITTENDEN. I think that some would not be, but I should have the preservative specified on the label and the quantity.

TESTIMONY OF ISAAC RHEINSTROM.

ISAAC RHEINSTROM, sworn and examined.

The CHAIRMAN. What is your residence?

Mr. RHEINSTROM. Cincinnati, Ohio.

The CHAIRMAN. What is your business?

Mr. RHEINSTROM. Distilling liqueurs—cordials.

The CHAIRMAN. You manufacture them in Cincinnati?

Mr. RHEINSTROM. Yes.

The CHAIRMAN. In this work what do you use?

Mr. RHEINSTROM. We use herbs, fruits, and spirits—cologne spirits.

The CHAIRMAN. That is, the pure spirits?

Mr. RHEINSTROM. It is refined alcohol. It is the spirit that is supposed to be free from fusel. That is, the alcohol distilled over, or refined.

The CHAIRMAN. What suggestion have you to make to the committee as to the enactment of a national law governing the manufacture of food products?

Mr. RHEINSTROM. I should say that such a law should provide that all goods sold to the public for pure should be pure and should be as represented; that any goods manufactured that contained any antiseptics, if they are considered unwholesome by the authorities, should not be used or allowed to be sold. Of course I can only speak of my own line of business, the distilling of those various liqueurs without resorting to any antiseptics of any kind, or glucose.

The CHAIRMAN. Your spirits and your liqueurs are self-preserved?

Mr. RHEINSTROM. Yes. Still we have goods, such as wine, that comes into our manufactory. They can be produced without resorting to any antiseptics by simply aging them sufficiently.

The CHAIRMAN. Do you use anything that you would consider dangerous or deleterious to the public health?

Mr. RHEINSTROM. We are not using anything that is considered injurious, by the authorities, to the public health. Therefore our experience is that these goods can be produced without resorting to anything injurious.

The CHAIRMAN. Have you ever had occasion to know or believe that those essences are produced in any other way—of course, I do not call for the names of any of your competitors.

Mr. RHEINSTROM. I am sorry to say, yes.

The CHAIRMAN. By the use of antiseptics?

Mr. RHEINSTROM. By the use of antiseptics. Where goods are sold as distilled when not distilled, but by the cold process—resorting to essential oils—essences, we think that that is wrong. If sold for distilled they should be distilled; if sold as made from herbs and fruits they should be made from the herbs and fruits—in this country as well as those imported from Europe.

The CHAIRMAN. If you have any other suggestion to make, the committee would be glad to hear it. You make your goods in an honest way and you would like your competitors to do the same?

Mr. RHEINSTROM. Yes; I would like to be put on the same footing. Our goods contain no impurities, and, of course, it is a great disadvantage to us when other people can sell their goods and guarantee them to be as good as ours when they are not what they are sold for.

TESTIMONY OF JAMES N. JARVIE.

JAMES N. JARVIE, of Arbuckle Bros., sworn and examined.

The CHAIRMAN. What is your residence and occupation?

Mr. JARVIE. My business address is No. 71 Water street, New York. I am in the coffee and sugar business.

The CHAIRMAN. In the coffee business, what do you do with the coffee?

Mr. JARVIE. We roast it.

The CHAIRMAN. You buy it and sell it?

Mr. JARVIE. We import it and roast it.

The CHAIRMAN. And put it up in cans?

Mr. JARVIE. In pound packages.

The CHAIRMAN. What is the name of it?

Mr. JARVIE. Our principal brand is Ariosa. We have others.

The CHAIRMAN. What others?

Mr. JARVIE. For instance, the "President's Cabinet," and "Java-ocha."

The CHAIRMAN. From what country do you import your coffee principally?

Mr. JARVIE. From Brazil.

The CHAIRMAN. Do you get any importations from any other country?

Mr. JARVIE. Yes; from all the coffee-growing countries of the world, I should say.

The CHAIRMAN. Do you sort your coffee—you have different grades of coffee?

Mr. JARVIE. Yes.

The CHAIRMAN. What makes the different grades; where it is raised, or the treatment?

Mr. JARVIE. Brazil grows a very fine coffee and a very poor coffee, and the grades are, of course, in between. The imperfections in the coffee are what make the grades.

The CHAIRMAN. What are those imperfections, generally?

Mr. JARVIE. Black beans, sticks, stones, dirt, etc.

The CHAIRMAN. When you say "black beans," you mean a coffee bean that was not matured?

Mr. JARVIE. That was not matured or that was damaged in its preparation.

The CHAIRMAN. In some countries they take that out, do they not?

Mr. JARVIE. Yes; they take it out in all countries—that is, from the finer grades.

The CHAIRMAN. And it is sorted by hand?

Mr. JARVIE. Yes.

The CHAIRMAN. Do the people in this country—the merchants here—sort their coffee?

Mr. JARVIE. Generally, no.

The CHAIRMAN. You know what is commonly spoken of as "black-jack;" do you know what that means?

Mr. JARVIE. In coffee?

The CHAIRMAN. Yes.

Mr. JARVIE. I do not.

The CHAIRMAN. Have you ever seen any coffee of such a low grade that it contains practically all dead beans?

Mr. JARVIE. Yes; I have.

The CHAIRMAN. That is shipped to this country largely from Germany, is it not?

Mr. JARVIE. No; it comes more from Central American countries than from any other.

The CHAIRMAN. It is the refuse after the coffee has been picked over, is it not?

Mr. JARVIE. Yes. It is the refuse, and it comes in in very small proportions.

The CHAIRMAN. What is done with it when it comes here?

Mr. JARVIE. I presume it is mixed, but that is presumption on my part. We do not handle that kind of coffee, so I do not know, but the proportion of it is so small that it would be lost in the shuffle. It certainly would not be 1 per cent of the coffee imported.

The CHAIRMAN. You do not mix it, you say?

Mr. JARVIE. No.

The CHAIRMAN. Do you know of anybody that does?

Mr. JARVIE. I do not.

The CHAIRMAN. Do you mix anything with your coffee?

Mr. JARVIE. Any adulterants?

The CHAIRMAN. Yes.

Mr. JARVIE. No. Coffee is so low in price to-day that it would not pay to do so if a man wanted to; and the difference between the high and the low grades is so small that it does not pay to handle such stock as you term "black-jack."

The CHAIRMAN. Then, as I understand you, you roast the coffee, and you send it out just as the grade that it comes in? You do not sort and do not mix?

Mr. JARVIE. Well, I do not say that, because coffee is generally improved by blending, and in that way, of course, it is mixed. It is very seldom that coffee of one grade or one country goes out by itself. It is generally blended, but that is for the purpose of giving a better result.

The CHAIRMAN. And not for the purpose of cheapening it?

Mr. JARVIE. No.

The CHAIRMAN. If you have any suggestion to make, I would be glad if you would make it to the committee. There has been considerable complaint, whether well founded or not I do not know, that there is a great mixture of coffee, and it is for your interest as well as for the interests of the consumers that the mixing of the cheap stuff that is brought here should not be permitted. You would favor, I suppose, a national law that would compel all packages of coffee to be stamped for what they contain, and if they contain anything but coffee that that fact should be stated.

Mr. JARVIE. Undoubtedly; but at this time coffee is so low in price that it would not pay.

The CHAIRMAN. It would not pay to adulterate it?

Mr. JARVIE. It would not pay to adulterate it, and for that reason I do not know of any adulterations coming in.

The CHAIRMAN. One of the leading merchants of Chicago came before our committee when they were there and showed us samples of this "black-jack" and testified that he was obliged to mix because his competitors mixed.

Mr. JARVIE. He must sell to a pretty poor class of trade.

The CHAIRMAN. He is one of the largest merchants in Chicago. He showed us what he called honest coffee and what he called the mixed

coffee. He showed us a coffee composed, I think he said, of 20 per cent of "black-jack" and coffee that has been rejected in other countries. He remarked himself about the low price of coffee and that it hardly paid to adulterate it. He said his competitors did it.

Mr. JARVIE. We are not his competitors, I am very thankful to say.

Do you wish to ask our chemist any questions? We do not use a chemist in the coffee business, but you requested me to bring our chemist with me, and he is here.

The CHAIRMAN. I shall be glad to ask him a few questions.

TESTIMONY OF LOUIS J. SCHILLER.

LOUIS J. SCHILLER, sworn and examined:

The CHAIRMAN. Where is your residence?

Mr. SCHILLER. At 467 Waverly avenue, Brooklyn.

The CHAIRMAN. What is your business?

Mr. SCHILLER. I am a chemist.

The CHAIRMAN. By whom are you employed?

Mr. SCHILLER. By Arbuckle Brothers.

The CHAIRMAN. In what capacity are you employed by them?

Mr. SCHILLER. As chemist.

The CHAIRMAN. What are your duties?

Mr. SCHILLER. The chemist examines all the raw products coming to the refinery and also all the refined material that goes out—the refined products.

The CHAIRMAN. Then you know what comes in and what goes out?

Mr. SCHILLER. Yes.

The CHAIRMAN. And you understand the process of making sugar?

Mr. SCHILLER. Yes. I have nothing to do with the coffee.

The CHAIRMAN. In the process of refining sugar or making sugar such as is used in this market what do you use?

Mr. SCHILLER. I do not quite understand that question—do you want the whole process.

The CHAIRMAN. Briefly. You understand that the committee does not want any trade secrets; they do not want to pry into the personal business of anybody, yourself or your employers; but we would like to know the material that goes to make the sugar that people have on their tables.

Mr. SCHILLER. Briefly, the raw sugar is, as it comes to us from different countries, dissolved in water and run over bags or through presses to remove the suspended impurities, and then it is run over bone char—bone black—to remove the soluble impurities. Then it is crystallized in a vacuum pan, and that is practically all the process. Of course there is a quantity of detail connected with it, but that is about all there is to it—four or five separate steps.

The CHAIRMAN. What proportion of the sugar do you manufacture, you think, that is used in this country?

Mr. SCHILLER. That I am unable to say.

The CHAIRMAN. You manufacture large amounts or you refine large amounts, do you not?

Mr. SCHILLER. Yes, we do. That, however, is also a question that I can hardly answer, as I am not acquainted with the market at all and do not follow it. We manufacture large quantities, compared with the English refiners, and we are considered large manufacturers

as compared with those. Our refinery is one of the largest in the country, but I do not know in just what proportion we manufacture.

The CHAIRMAN. I wish to inquire if there is anything that goes into that sugar besides the raw sugar.

Mr. SCHILLER. At one stage, after the sugar is dissolved, lime is used to correct acidity. All the refiners use lime, and some refiners are in the habit of using blood or albumen or other material in its place, for the purpose of clarifying or removing the suspended impurities.

The CHAIRMAN. Is there any grade of sugar made in this country to your knowledge in which starch is used?

Mr. SCHILLER. No, sir.

The CHAIRMAN. Or any other adulterant to cheapen the product.

Mr. SCHILLER. No, sir; I have never seen any. It is my business to examine samples. I have been over, I suppose, several hundred and I have never seen a sample that I considered an adulterant. I think that in 1882 I saw two samples. One was of granulated sugar that had a large proportion of granulated glucose in it. That was seventeen years ago, and since then I have seen nothing. Where those two samples came from I do not know. I was assistant chemist at the time and did not follow the matter up.

The CHAIRMAN. You can not mix glucose sugar with the sugar you make, can you?

Mr. SCHILLER. No, sir.

The CHAIRMAN. You could not if you wanted to, could you?

Mr. SCHILLER. A blind man could tell the difference immediately. We get 99.8 of pure sugar; a couple of tenths of impurities, possibly made up of one-tenth moisture and one-tenth of ash.

The CHAIRMAN. You mean 99 per cent of pure cane sugar?

Mr. SCHILLER. Yes. Granulated sugar is practically pure sugar, as good as it is possible to make. Any dry substance, if absolutely dry, will absorb a little amount of moisture. A barrel of sugar will take up a very small amount of moisture. I have seen our record run 99.9.

The CHAIRMAN. Is zinc used in any of the processes?

Mr. SCHILLER. No, sir. There are processes, I believe, that are patented that use zinc, but none are used in the refinery.

The CHAIRMAN. As to this powdered sugar, it is currently thought and believed by many people that that is mixed or adulterated with starch—corn flour, as it is called. You never saw any of that?

Mr. SCHILLER. No.

The CHAIRMAN. You have no occasion to buy starch in your refinery at all?

Mr. SCHILLER. No. I do not know but what the starch is about as valuable as the sugar. I do not, however, know anything about the processes of starch.

The CHAIRMAN. Nor what they call corn flour?

Mr. SCHILLER. Our powdered sugar is just as pure as our granulated sugar.

The CHAIRMAN. How is it powdered—by grinding?

Mr. SCHILLER. By grinding. It is run through sieves.

The CHAIRMAN. There is a feeling prevalent among the people that there is a good deal of impure sugar, and I think that this testimony will have a tendency to remove that impression.

Mr. SCHILLER. I wish that all products were as pure as sugar.

TESTIMONY OF MORITZ EISNER.

MORITZ EISNER, sworn and examined.

The CHAIRMAN. What is your business?

Mr. EISNER. We are importers of mineral waters and agents for Hoff's Malt Extract.

The CHAIRMAN. Where is that made?

Mr. EISNER. Hoff's Malt Extract is made in this country and abroad?

The CHAIRMAN. Made there and here both?

Mr. EISNER. Yes.

The CHAIRMAN. Are those who make it the same parties in both countries?

Mr. EISNER. It is owned by one company now.

The CHAIRMAN. What do you use in manufacturing this extract?

Mr. EISNER. Malt.

The CHAIRMAN. Do you use any other cereal besides malt?

Mr. EISNER. No.

The CHAIRMAN. No rice nor corn?

Mr. EISNER. No.

The CHAIRMAN. It is just extract of malt?

Mr. EISNER. Malt and bitter principles.

The CHAIRMAN. You use hops then?

Mr. EISNER. To a certain extent.

The CHAIRMAN. Where do you get your bitter principle except in hops?

Mr. EISNER. Well, it is a proprietary article, and the process is a trade secret.

The CHAIRMAN. You use a bitter principle with the malt?

Mr. EISNER. Yes.

The CHAIRMAN. Are you willing to state whether in your opinion it is a vegetable principle?

Mr. EISNER. Yes, sir.

The CHAIRMAN. It is a vegetable principle; so that in your opinion it is not deleterious to public health?

Mr. EISNER. On the contrary.

The CHAIRMAN. On the contrary, you think it is healthful?

Mr. EISNER. Yes.

The CHAIRMAN. Do you use any antiseptics or preservatives?

Mr. EISNER. None whatever.

The CHAIRMAN. Do you pasteurize it?

Mr. EISNER. Yes, to the degree of 55° Réaumur.

The CHAIRMAN. That is enough to effect the pasteurizing process?

Mr. EISNER. Fully.

The CHAIRMAN. Have you any suggestion to make as to a national law fixing a standard of malt extract?

Mr. EISNER. Very much. Every brewer is now selling beer as malt extract.

The CHAIRMAN. Your extract contains some alcohol.

Mr. EISNER. A minute quantity. The difference between beer and malt extract like ours is that ours contains a minute quantity of alcohol and large quantities of malt, whereas beer is the other way.

The CHAIRMAN. Do you know what the word "Kaiser" means as applied to a standard—such a "percentage of Kaiser;" that means such a percentage, as I understand it, of malt extract.

Dr. WILEY. Kreuzen, I suppose.

Mr. EISNER. That is a German expression for the percentage of malt extract.

The CHAIRMAN. Do you think that the Government ought in a general way to compel the percentage of malt extract to be marked?

Mr. EISNER. The foreign governments do.

The CHAIRMAN. What governments?

Mr. EISNER. The German and Austrian Governments, to my knowledge.

The CHAIRMAN. They compel it in one way by seeing first that they collect their tax on so much barley?

Mr. EISNER. I do not exactly know the law abroad, but it is a fact that beer could not be sold as malt extract without a certain percentage of malt extract, "Kreuzen," as they call it. That is 20 per cent of malt extract.

The CHAIRMAN. There is very little beer sold in this country with such a percentage?

Mr. EISNER. There is very little sold up to 10 per cent.

The CHAIRMAN. What would you say about fixing a standard for a proprietary article?

Mr. EISNER. If it is sold for a malt extract it should be a malt extract, otherwise it should be called beer.

TESTIMONY OF PROF. WILLIS G. TUCKER.

WILLIS G. TUCKER, sworn and examined:

The CHAIRMAN. If agreeable to you, Professor Tucker, I will ask Dr. Wiley to propound the questions to you, as I am not feeling at all well this morning.

Professor TUCKER. It is quite agreeable to me.

Dr. WILEY. Please state your profession, Professor Tucker.

Professor TUCKER. I am professor of chemistry in the Albany Medical College and director of the State board of health of New York State.

Dr. WILEY. Have you long been engaged in the examination of food products?

Professor TUCKER. I have been more or less engaged in that work for a period extending over some twenty years.

Dr. WILEY. Have you studied the subject of the adulteration of human food?

Professor TUCKER. I have.

Dr. WILEY. Will you state for the benefit of the committee some of the lines of study which you have undertaken, using your own words and developing the lines which you have followed, and the character and extent of adulteration which you have covered?

Professor TUCKER. Well, I hardly know how to begin to answer that question. General examination of food and drugs under the New York State laws is placed under the control of the State board of health, with the exception of dairy products and vinegar which are under the charge of the board of agriculture. Some years ago we made some investigation of food articles, but during the last few years we have done little work in this direction on account of the insufficiency of our appropriations for our work, so that our work has been confined in large part to the examination of drugs; and my work has been largely confined to that line and to analyses of waters and such miscellaneous work as the State board of health places in my

hands. So that during the last few years we have not carried on any very active work in the examination of foods proper.

Dr. WILEY. In the examination of drugs have you ever had occasion to examine those which are sometimes used as food preservatives—such as formaldehyde, salicylic acid, benzoic acid, etc.?

Professor TUCKER. Not specially; no, sir.

Dr. WILEY. In your former examination of food products was your attention directed to the use of preservatives in foods?

Professor TUCKER. At the time we were most actively engaged in that work the use of food preservatives was not nearly as common as now, so that we have done not very much work in that particular direction.

Dr. WILEY. Can you state what is the attitude of the New York State board of health toward the subject of preservatives in foods?

Professor TUCKER. I do not think that they have ever declared their attitude precisely. The matter has come up in various ways in our legislature during the last few years, and our general law covers the whole case really, because it prescribes the use of deleterious constituents, and a food preservative, if found to be deleterious, would not need to be specifically named in the law or in the regulations of the board. It would come under the general law. We have law enough, perhaps, in New York State. The difficulty is with enforcing it without sufficient appropriations to carry on constant inspection, and prosecuting cases, or to secure the cooperation of the district attorneys of different counties. Without that, no great results can be reached.

Dr. WILEY. Has the State board of health or any other authority established standards of purity for foods?

Professor TUCKER. They have the right so to do, but they have established no such standard except in the case of mustard, I believe, some years ago, and one or two other articles.

Dr. WILEY. As to vinegar, do you know whether they have established a standard for that?

Professor TUCKER. We have a special law that does that.

Dr. WILEY. What is pure vinegar under the law of the State of New York?

Professor TUCKER. It is outside of my department, as I stated, but my impression is that it is $4\frac{1}{2}$ per cent of absolute acetic acid and $2\frac{1}{2}$ per cent of cider vinegar.

Dr. WILEY. Is it your information that only a cider vinegar is regarded as a pure vinegar in this State, or is malt vinegar regarded as pure also?

Professor TUCKER. Yes; malt vinegar, if not sophisticated.

Dr. WILEY. What is your own opinion, as one of the health officers, as to the effect of food preservatives on the general health?

Professor TUCKER. That is a pretty broad question. Salt is a preservative; sugar is a preservative; alcohol is a preservative. We have had and used preservatives from time immemorial. The housewife puts up brandy peaches and other such things; we have corned our meats and have used organic and inorganic substances in the preservation of food products from time immemorial. So that I do not think we could start by saying that the general use of preservatives is injurious. In many cases there is certainly room for difference of opinion, as to the effects of the quantities of such things as borax, boracic acid, salicylic acid, formaldehyde, and such things, in the quantities ordinarily used in foods for the human system. That

difference of opinion exists among experts; it is a "disagreement of the doctors," so to speak, and has been heard many times in our legislative hearings and before committees.

Dr. WILEY. I call your attention to the subject because your opinion will be valuable to the committee, as an expert, as to what legal steps should be taken to control the use of preservatives in foods by the Federal Government, not the State government, but for the controlling of interstate commerce, inasmuch as that is as far as the Federal law can apply.

For instance, Professor Tucker, you have a law in the State of New York which prevents food adulteration. If a person is convicted he may be a perfectly innocent person because the food which he sells may have been made in Pennsylvania, and New York is powerless to strike the guilty party. The object of a Federal law would be to strike that guilty party.

What would be your idea of a Federal law controlling the use of say suspicious preservatives—not sugar, nor salt, but such things as you have mentioned yourself as being doubtful—such as salicylic acid and formaldehyde.

Professor TUCKER. My opinion being that salicylic acid is the most objectionable of the preservatives now said to be commonly used, it would be desirable I think if food articles to which it has been added had the fact stated upon the label or package in which the goods are contained.

I should not feel like giving it as my opinion that salicylic acid is necessarily harmful to all persons in such small quantities as may be sufficient to preserve certain food articles; but I think there is some evidence tending to that view, and that the public should not be fed with staple articles of food in which a medicinal agent so active as salicylic acid is introduced, perhaps in excessive quantities, and by ignorant compounders, without knowing the fact.

Dr. WILEY. Do you not know that in point of fact the health officers of most countries have interdicted the use of salicylic acid in food products?

Professor TUCKER. I believe it has been interdicted in several foreign countries—for goods of home consumption at least.

Dr. WILEY. Do you not know that the brewers as a class have ceased entirely to use salicylic acid in their beers?

Professor TUCKER. No; I do not.

Dr. WILEY. It is evidently the easiest way to preserve beer, to use salicylic acid, and if it is not injurious the brewers would be justified in using it, while in point of fact, I believe, as far as my observation has gone, its use in this country has almost ceased because the brewers themselves regard it as objectionable.

The CHAIRMAN. There have been several of them here that testify that they are using it now.

Professor TUCKER. I think it is being used by bottlers of beers, if not by the makers.

Dr. O'SULLIVAN. One gentleman went so far as to say how much of this acid a consumer would get in a glass of beer. That was Mr. Wyatt.

The CHAIRMAN. And he said that in such small quantities as that it was not harmful. I think he said it was one drop of the acid to ten thousand of the beer.

Dr. O'SULLIVAN. He figured it at a quarter of a grain to a glass of beer.

Professor TUCKER. I am of the opinion that it is generally used yet in light wines of the claret class that are sold of the cheaper grades. Is not that your experience?

Dr. WILEY. I have not examined wines for seven or eight years, but beers I have examined within the past year, and the percentage of salicylic acid I found to be extremely small if you buy the beer of established brewers.

Dr. O'SULLIVAN. They say that they pasteurize bottled beer and put salicylic acid in the wood.

Dr. WILEY. I have not examined barreled beer lately.

The CHAIRMAN. Some of them said they did it when it was to be shipped or to be kept for any length of time. I think that two or three of the brewers testified to that, and Dr. Wyatt approved it and said it was harmless.

Dr. WILEY. What is your opinion, Professor Tucker, regarding the establishment of a national commission of competent experts to determine questions of this kind?

Professor TUCKER. I should entirely favor it. I think that is the right direction in which we should move. I think much time is lost and money uselessly spent by the different States in going over and over the same ground and in a different way.

There is much talk in the air about adulteration—so many people believe that the ordinary articles of food are so much adulterated or sophisticated that they need to be answered, and in form.

For my own part I believe there are much less adulterations than is popularly supposed. The case of starch and sugar is a case in point. The common idea is that confectionery sugar is starch or marble dust. Probably you could collect a thousand samples without finding other than pure samples. It is a case like that of calves' brains, and milk, and a thousand other fictions.

Coffee is sold as a mixture. Of course there are many common varieties, but I do not believe that they consist of the deleterious materials and rubbish which we find published in some of our daily papers, such as was published in this city last summer—a case or two being spread out into a great lot of figures. The public is misled and misinformed.

One State, in attempting to do the work for itself, goes all over what another State has done. One reason why I do not always favor investigations of this class is because of the work that such men as you (Dr. Wiley) have done, so much standard classical work, and for New York State to re-collect the same articles and go all over the work again would be waste of money.

But the idea of a national commission who should have competent means to investigate and tell the people what articles are and what are not harmful, appointed to recommend national legislation bearing on these questions—that is the right method of going to work at the remedy, I think.

Dr. WILEY. Aside, now, from substances that may be considered injurious to health, what is your idea of other adulterations which are not particularly injurious, but are simply fraudulent?

Professor TUCKER. I do not know that they need any other special protection than the State gives to other articles of consumption.

The man who buys the cheapest goods that he can find in the market has no right to expect that he will get the first quality. And if we pay the price of cotton goods, we can not expect to get all linen. If we pay the price of shoddy we can not expect to get pure wool. If

we buy the cheapest ground coffee and the cheapest sirups and flavoring extracts and the like that we can find in the market, and the lowest grade of pease and such things, I do not think that the consumer has the right to expect that the State will assure him that he is getting articles of the purest quality.

I think that perhaps in some respects we have had a little more legislation than we need—legislation which in some cases has been oppressive and has affected certain industries harmfully, and which the public has not needed or deserved.

Dr. WILEY. In other words, it is your opinion that a food product which is in itself wholesome should not be forbidden to the market?

Professor TUCKER. Certainly; that is my opinion.

Dr. WILEY. Hence you would say that a law forbidding the sale of oleomargarine as such would be unjust?

Professor TUCKER. Entirely so; fit for the dominions of the Czar of Russia—not the United States.

Dr. WILEY. But a law which would forbid oleomargarine to be sold as anything but oleomargarine would be right, in your opinion?

Professor TUCKER. Yes.

Dr. WILEY. And a law which forbade the sale of glucose as anything but glucose?

Professor TUCKER. Yes.

Dr. WILEY. And it should not be permitted to be sold as, for instance, honey?

Professor TUCKER. No. A man who goes into a department store and buys a pint of olive oil for 20 cents labeled as a foreign olive oil has no right to expect that he is getting real Italian oil. I do not know, as a matter of abstract fact, that the State is called upon to protect him against the sale of cotton-seed oil or peanut oil, or some other oil in place of real olive oil, any more than it would be called upon to guarantee to him that when he buys a linen handkerchief it should be all linen.

Dr. WILEY. What is to prevent the department store to which you refer from selling that oil for 80 cents instead of 20 cents, and charging for the inferior article the price of the genuine article?

Professor TUCKER. I think business would settle that. A man willing to pay the 80 cents or the full price would be capable of telling whether he got the right article.

Dr. WILEY. But is every ordinary consumer capable of judging the genuine article and distinguishing it from the other?

Professor TUCKER. Perhaps not the ordinary consumer.

Dr. WILEY. If you should take a hundred men and serve them with cotton oil in this restaurant downstairs in this hotel do you think they could tell the difference between that and the olive oil?

Professor TUCKER. I think 90 per cent of them would know the difference.

Dr. WILEY. Well, I do not think that 10 per cent could. I doubt if 5 could.

Professor TUCKER. Undoubtedly the cardinal principle is that goods should be sold under their correct names. I do not think that an inferior or cheaper oil should be sold for olive oil, but I do not know how important a matter that is in comparison with a great many other matters of far greater importance; that would be for a commission to determine. I should not deem that a matter of great importance.

Dr. WILEY. I will say that I use constantly cotton oil on my salads

at my own house because I am too poor to buy the genuine olive oil, but I get my cotton oil from a dealer who sells it for what it is, and makes no pretense that it is anything else. That is the proper way to do. But I have no doubt that hundreds of people are paying for olive oil and not getting it, to the great detriment of the olive-oil industry. So that I think it should be a misdemeanor to sell a thing for what it is not; and we must remember that the question is not whether the article is a linen handkerchief, but that it is a matter of human food.

Professor TUCKER. I agree with you that goods should be as represented.

Dr. WILEY. You are not familiar with what the State board of agriculture has done in regard to dairy products and vinegar?

Professor TUCKER. I should rather not speak for them. They have a department of chemistry in Albany and other places throughout the State.

Dr. WILEY. I entirely agree with Dr. Tucker concerning erroneous opinions regarding food adulteration. It is not nearly as bad as represented, but if it exists at all it should receive public attention.

Is there any other statement that you would like to make, Dr. Tucker, for the benefit of the committee in regard to your work in connection with the board of health of the State in respect to the control of food products or as to the method in which Federal legislation might help you in your work? If there is any suggestion that you can make in that line it would be useful to the committee.

Professor TUCKER. I do not know that there is any suggestion that I could make, because that involves legal considerations that I have not considered—as to how largely the National Government could control the sale of articles made outside the State, in a State, or if in the State, their sale in that same State.

Dr. WILEY. Of course the national Congress could not enact laws for the benefit of a State, but it could control commerce as between the States, so that if the sale took place in one State and the manufacture took place in another, they could punish for the wrongdoing. The object of a State law would be to supplement that and make it effective. I do not think that it is the purpose of this committee of the Senate or of anyone else to propose the enactment of a law having any restrictive provisions with regard to commerce in food products. On the contrary, the largest liberty could be allowed and would be allowed in such a law. The only point to be established and required would be that complete honesty should characterize interstate dealings in food products.

Professor TUCKER. I believe that the findings or conclusions of such a commission as you refer to would be very valuable in that they would probably be enacted into law in the various States.

Dr. WILEY. They would be a guide for State legislation; that is a good point.

Professor TUCKER. The boards of health of a State would, I think, regard with much favor any findings of a national commission which was made up of experts in those lines of work, and I think therefore that it would be a great gain to the States. It would be doing what a good many States are undertaking to do or are about doing for themselves. It would give a model for the States.

Dr. WILEY. In a bill that was before the last Congress a provision for such a board or commission was made—a commission to prescribe food standards, etc.

Dr. O'SULLIVAN. How was the board to be composed?

Dr. WILEY. It was to be composed of physicians, physiologists, etc., and to be appointed by the President of the United States.

Dr. O'SULLIVAN. Such a board so constituted would be the best instrumentality for determining whether the preservatives that have been under discussion are or are not beneficial.

Professor TUCKER. When there were up before the State legislature some bills regulating the sale or employment of some food article, the interests that favored its use came before the committee, by representatives paid by them, to argue the case. Hence partisan views are often exploited in this manner and we do not even get at the facts of the case. A commission such as is suggested would give us the facts.

Dr. O'SULLIVAN. Not only that, but the action of preservatives whose action is in question can only be settled by an impartial series of experiments conducted by physiological chemists.

Dr. WILEY. In connection with what Dr. Tucker has said as to a model for State legislation I will state that the State of Indiana applied to me last year for a model of a pure-food bill. I took a copy of the bill then before Congress and sent that to them and that bill was enacted bodily by the legislature of Indiana. So that I think a law of Congress would have this beneficial result, that it would tend to unify the legislation of the States.

The committee adjourned until to-morrow, Friday, November 17, 1899, at 10.30 a. m.

COMMITTEE ON MANUFACTURES, U. S. SENATE,
IMPERIAL HOTEL, NEW YORK CITY,
Friday, November 17, 1899.

TESTIMONY OF WILLIAM J. ROGERS.

WILLIAM J. ROGERS, sworn and examined:

The CHAIRMAN. Please state your residence and occupation.

Mr. ROGERS. I reside in Orange, N. J. My place of business is in New York City, No. 71 Hudson street. I am with Borden's Condensed Milk Company.

The CHAIRMAN. What position do you hold with that company?

Mr. ROGERS. My title is that of secretary of the company. I have charge of marketing the product.

The CHAIRMAN. Where are your factories?

Mr. ROGERS. We have twelve in the State of New York; five in Illinois. When I say factories, I mean factories and other establishments.

The CHAIRMAN. Your concern condenses a very large proportion of the condensed milk that is sold, does it not?

Mr. ROGERS. Yes.

The CHAIRMAN. What percentage, do you think? I do not ask that you be very accurate, but you can doubtless give an approximation.

Mr. ROGERS. Fully 50 per cent of it, I should say. You are referring to the domestic manufacture?

The CHAIRMAN. Yes.

Mr. ROGERS. Fully 50 per cent.

The CHAIRMAN. A witness before the committee in Chicago, whose

name I have forgotten, gave it as his opinion, offhand, that a certain amount of this condensed milk or alleged condensed milk was depleted of its cream and fatty substances before condensation, and that therefore it was not unhealthy, perhaps, but not so nutritious for food as was generally supposed. What do you say as to that?

Mr. ROGERS. That has been done beyond any question of doubt.

The CHAIRMAN. It has been done, you say?

Mr. ROGERS. Yes, sir.

The CHAIRMAN. Do you know generally about the management of your factories?

Mr. ROGERS. Yes; entirely.

The CHAIRMAN. Do you know what the rule is, or what the process is in the respect I have mentioned?

Mr. ROGERS. Yes. I have been connected with the company some thirty-five years and have seen it grow from a very small beginning to a very large business. We are to-day perhaps the largest handlers of milk in the world. In a controversy which we had with a foreign government—a Canadian government—I made an affidavit, of which I have a copy, and which I am prepared to repeat to-day. I will say in passing that this controversy still exists, although the foreign government to which I refer has withdrawn its statement. My affidavit was to the effect that in all our experience of about forty years, or to be more exact, say thirty-five years, we have never adulterated our product, never skimmed the milk, or in any way permitted any of our product to be contaminated. That our product is perfectly pure is beyond all question.

The CHAIRMAN. I have been in your factory at Brewsters and seen the simple process, which is merely extracting the water and putting in sugar to preserve it. Is not that about all there is of it?

Mr. ROGERS. Yes, sir; that is it. I think there was a request made that our chemist should come here at the same time that I did; but we have no chemist; we have no occasion for a chemist.

The CHAIRMAN. What are the names of the gentlemen connected with your company?

Mr. ROGERS. Mr. Church, Mr. Eno, and Mr. Lewis.

The CHAIRMAN. What kind of sugar do you use?

Mr. ROGERS. Nothing but the finest granulated sugar, made especially for us, free from adulteration and all coloring matter. I presume you are aware that coloring matters are sometimes used in sugars?

The CHAIRMAN. Yes; for bleaching them.

Mr. ROGERS. Our stipulation that there shall be no coloring matter in the sugar dates back many years. We do not go into the open market and buy sugar, but get from one source sugar that is guaranteed to us to be the best refined sugar.

The CHAIRMAN. As I have said, it was stated before our committee that the milk was skimmed before being condensed, but I do not think the man who made the statement knew anything personally on the subject; and as I am somewhat familiar with the process carried on in your factories from having lived in the neighborhood of one of them in the summer time, I thought I should like to have you come here and make a statement to the committee about your methods.

Mr. ROGERS. You can readily understand, Mr. Chairman, that no reputable manufacturer, of large experience especially, can afford to adulterate the milk, because if he did so it would be known, not only to the superintendent of the factories, but to other manufacturers.

The CHAIRMAN. And the farmers whom you perhaps watch would watch you in turn.

Mr. ROGERS. Yes; and adulterations that are discovered would result in prosecutions. There have been some unquestionably in this city during the past six months; there have been prosecutions for using skimmed or partly skimmed milk.

The testimony given before this committee during the last days has been very interesting to me, as I listened to it, because I have very strong ideas on the subject of adulterations of milk and how to protect that article above every other. I think it is a crime to adulterate or tamper with milk, because so many infants depend on it altogether for food.

The CHAIRMAN. And invalids.

Mr. ROGERS. Yes. I presume that 50 per cent of the children of the country to-day are being brought up on artificial food, that is, milk and cereals.

In the case of condensed milk, if you take the butter fats away, the child is being starved to death without the parent knowing what is the matter. For that reason we make it a crime in this State to first skim milk before condensing it. It is prohibited. In other countries it is not prohibited.

Years ago we stopped Europeans from bringing such products into this country and marketing them here. We are prepared at all times to prosecute or secure the prosecution of such cases. If we know positively of such cases, we will follow them to the end.

Some years ago some parties in your own State, Mr. Chairman, were putting out an adulterated condensed milk and we had occasion to take action in the matter. When they would market their condensed milk in States that had no laws for the protection of the people, I would follow every shipment. Where there were boards of health I would notify those boards; and where there were no such boards I would notify the State governments; and in that way we hurt them, particularly in the States of the South, in which no means of examination had been provided by law, for the product which these people were sending there. Had we not done as we did the children who would have been fed on such condensed milk would have been starved to death.

We have taken every means as honest manufacturers to prevent the marketing of products of that kind. I wrote to the governors of the various States to which those goods were sent, after first satisfying myself by chemical analysis, by the best chemists I could find, of the facts of which I informed them.

[Exhibiting a paper.] Here is a copy of the paper I sent to those governors of the various States to which those goods were sent; and you can readily see that that was a dangerous thing for a corporation to do—to send out such documents—unless they had something back of it in the way of facts.

The CHAIRMAN. I see that it states that one of those condensed milks contained less than one-quarter of 1 per cent of animal fat—thirty-six one hundredths.

Mr. ROGERS. Yes; and a child taking it would be starved to death.

The CHAIRMAN. If you will give us a copy of that affidavit, I shall be glad to have it inserted in the record as a part of your testimony. Still, you are under oath as it is.

Mr. ROGERS. Yes, but still I should like that to appear as an affidavit made as of this date.

The CHAIRMAN. Very well. There are other large concerns in the country in the same business I suppose, or are the others generally small?

Mr. ROGERS. In this country there is no other large concern outside of the Anglo-Swiss Company, which is a foreign corporation. They have a large capital. They have a large concern on the other side and two in this country.

The CHAIRMAN. They have one at Dixon, Ill., I believe?

Mr. ROGERS. Yes. The only fault we have to find with them is that they are a foreign corporation.

The CHAIRMAN. But in the interests of justice and fair play you say they are making the same class of goods that you are making?

Mr. ROGERS. Beyond a doubt; and that also applies to another corporation—a Michigan corporation of which General Alger is president. The adulteration comes from small concerns that branch out and mark their goods with fictitious names—the names of fictitious companies. One of the great troubles with our present laws is that they do not reach that class of people.

The CHAIRMAN. Would you favor a national law on the subject?

Mr. ROGERS. Most decidedly.

The CHAIRMAN. Either to prohibit the condensing of skimmed milk or to compel those who condense to sell it as such?

Mr. ROGERS. I should prohibit its condensation, for the reason that the temptation is so great. They can take one-half per cent of butter fat, for instance, and still make a fairly good product; but the honest and fair manufacturer is not being properly treated.

The CHAIRMAN. And the consumer is not getting what he buys, as he understands.

Mr. ROGERS. No.

I show you now a statement of one of our plants. (We have the same statement for all our plants.) I call your attention to this only to answer your question. You see here [exhibiting] that the first column of this statement contains the name of the farmer, the next column the lacteal test, the next column the cream test, the next the butter-fat test. This is the milk that we are supplying to-day for the family trade, and in that you will see that the butter-fat test runs at an average of 4.7 per cent.

The CHAIRMAN. Yes; I see that some run as high as 5 per cent and some as low as 4.4.

Mr. ROGERS. Yes.

The CHAIRMAN. At what place is this?

Mr. ROGERS. At Oxford, in the State of New York. That is only a fair average as to the butter fats. We have them run as high as 6 per cent. The laws of the State of New York state that milk is bad milk if it contains less than 12 per cent of milk solids or more than 88 per cent of water or fluids. Our average of solids is 13.47 per cent. The law also states that good milk must contain not less than 3 per cent of fats. We are receiving milk that contains an average of 4.7. We could turn that difference into butter and still keep within the law so far as condensed milk is concerned.

The CHAIRMAN. But, as you say, in handling such an immense amount and doing such an immense business it would be impossible to do it without your customers finding it out?

Mr. ROGERS. Yes. And the reputation that we have been forty years building up would be gone, and we should have attached to us the odium of starving hundreds of thousands of infants throughout the United States and many parts of Europe.

So, you see, as I remarked before, the only absolute security is to prohibit altogether the condensation of defective milk.

On the question of a national law I would like to say a word, and I wish to do it with all due respect to the local board of health, whose work is very accurate, and the State board of health, which is desirous that the people of New York should have pure milk, a desire in which we heartily join. New York, to-day, is getting the best milk in the world. I have had very many years' experience in this matter, and I have no hesitation in saying that the milk supplied to the families of New York is the best produced and sold in any State. But, Mr. Chairman, the dairy commissioners of your own State (Illinois) first discovered that adulterated milk was being marketed in this city to the extent of tens of thousands of cases within the past six months; and the cases were taken up and prosecuted. The local board of health, which has always been very active on the question of milk, also later took up some cases and prosecuted them.

When they find in a man's store several thousand cases of milk, they have only one offense against that man. He sold a can of condensed milk made from skimmed milk. They prosecute that man. He is tried and the court fines him. He is not allowed to sell his milk here. Well, he simply takes it out of his store and sends it into the next State, where he sells it.

Being at the head of a large corporation and finding it necessary that all should produce a good article, I naturally keep in touch with those things. I knew that that milk went out of the State, but I could not watch it sufficiently close to determine whether it went to New Jersey or to Pennsylvania or to Connecticut; but it did go out of this State and has not been sold in this State since; that is to say, not under the brand or name by which it was known; but it was sold somewhere. There are no means of reaching such cases. If there were a national board I should simply notify the national board that so many cases were condemned in this State.

The CHAIRMAN. That would make it uniform?

Mr. ROGERS. Yes. It was not the fault of the officials here.

The CHAIRMAN. They drove it out of New York?

Mr. ROGERS. Yes; they drove it out of here, but they do not go far enough; they can not.

The CHAIRMAN. The capture ends at the State line?

Mr. ROGERS. Yes.

The following is a copy of one of the affidavits exhibited by the witness and made part of his testimony in this proceeding:

STATE OF NEW YORK, *City of New York, County of New York, ss.*

William J. Rogers, being duly sworn, doth depose and say, that he is secretary of the New York Condensed Milk Company, a corporation organized and doing business under the laws of the State of New Jersey, and operating factories for the condensing of milk in the States of New York and Illinois; that he is personally acquainted with all the details incident to the manufacture of this product, and hereby certifies that the milk received and used at its various factories is the product of the very best dairies, and is of the finest quality obtainable in the United States; that the percentage of butter fats in this milk exceeds in all instances the percentage required by the laws of these States; and that no portion of the butter fats or other valuable constituents in the milk are in any wise removed from the milk during the various processes incident to its handling and manufacture; that the only constituent which is removed is water, and this

for the purpose of reducing in volume. He further certifies that the only foreign substance added to the milk is pure, refined, granulated sugar of the best quality, which is used solely for the purpose of preservation. He also further certifies that no other substance has ever been added to the products of the New York Condensed Milk Company, as marketed under the labels bearing its name, and also states that the New York Condensed Milk Company never bought or otherwise obtained any glucose, and never, under any circumstances, has used this article or a similar product for any purpose whatever. It therefore naturally follows that the brands of the New York Condensed Milk Company will be found by careful and proper analysis to contain the percentage of butter fats that they should, and that, furthermore, it is impossible to find glucose or any other foreign substance, except pure sugar as herein stated, in any of the brands bearing the name of the New York Condensed Milk Company, in view of the fact that in the manufacture of the milk none has been added.

WM. J. ROGERS.

Sworn to before me this 17th day of March, 1897.

ALEX WILEY, *Notary Public.*

TESTIMONY OF CAVALIERE GUIDO ROSSATI.

CAVALIERE GUIDO ROSSATI, sworn, and examined.

The CHAIRMAN. Will you please state your residence and occupation?

Mr. ROSSATI. I am in charge of a laboratory at No. 17 State street, New York City, established two or three years ago by the department of agriculture of the Government of Italy for the convenience of Italian importers here, for the analysis of Italian wines and oils that arrive in this country and that are voluntarily submitted to me by importers.

I desire to state that I have come before your committee, Mr. Chairman, in order to say something about the experience I have had in this line of business, and also, if I may take the liberty, to make a few recommendations.

My business is that of a wine expert, in the employ of the Italian department of agriculture. I am a diplômé, I may say, of a wine school at Conegliano, in Italy, which is a superior agricultural school. My mission is to analyze Italian wines and Italian olive oils that are submitted to me, as I have said, by the importers, voluntarily on their part, and to grant certificates of analysis stating the purity of the articles examined, if that results from the analysis, of course.

I present for the information of the committee a sheet of regulations under which the work is conducted.

The paper is as follows:

REGULATIONS FOR THE ANALYSIS OF ITALIAN WINES AND THE ISSUING OF CERTIFICATES RELATING THERETO BY THE CENOTECHNIC STATION OF THE ITALIAN GOVERNMENT AT 17 STATE STREET, NEW YORK.

The cenotechnic station of the Italian Government at New York will issue, on the request of the importer, certificates of the analysis of Italian wines in accordance with the following rules:

1. The importer will notify in writing the Government representative of the arrival of the wines, indicating the source, quantity, marks, and the vessel by

which they came. He should state at the same time whether the sampling is to be made on the wharf, custom-house stores, or in his own warehouse.

2. The importer must allow the samples to be taken by the Government representative in sufficient quantity from each cask in order that the representative may make the chemical analysis, and should also furnish him with the necessary assistance for opening the casks in order to obtain the samples. The representative of the Government will apply to the cask a label showing that the wine is in the course of examination. This label should be so applied as to prevent any change of the liquid in the cask.

3. The Government representative will deliver to the importer a certificate indicating the result of the analysis qualitative, quantitative, and microscopic, upon which also will be stated the name of the vessel in which the wine was imported, the date of its arrival, the marks, and the quantity of the parcel, and, when the importer so desires, the name of the shipper as well.

4. If the result of the analysis shows the wine pure, clean, and healthy, the Government will apply to the cask or to each case or package a label testifying to the purity and genuineness of the wine. This label will be so placed that it will be necessary to destroy it in opening the cask or the case. In case of a change of the wine from one cask to another, or any other operation that requires a change of package, the merchant will give notice to the Government representative in order to obtain new labels, which will be issued upon presentation of the original.

5. If the analysis shows that the wine is adulterated or defective, the Government representative will deliver a certificate stating the adulteration or the defect, and with this certificate indorsed by the Italian consul the importer may make reclamation upon the shipper for damages and expenses according to law; the sale of wines recognized to be adulterated with substances injurious to health being severely prohibited by the laws of Italy and the United States. Here the attention of merchants in general is called also to the following article from the Revised Statutes of the United States:

"SEC. 3449.—Whenever any person ships, transports or removes any spirituous or fermented liquors or wines, under any other than the proper name or brand known to the trade as designating the kind and quality of the contents of the casks or packages containing the same, or causes such act to be done, he shall forfeit said liquors or wines and casks or packages, and be subject to pay a fine of \$500."

6. The importer who wishes to bottle Italian wines which have been found pure and genuine by the Government representative here, and who desires to apply to the bottles a special label showing that this is the case, should give notice to the officer in order that the operation may be made under his superintendence. This label will be so applied to the bottle that it will be destroyed when the cork is removed.

7. The tax for the analysis and certificate will be \$2. Upon the payment of the necessary expense the labels showing the purity and genuineness of the wine analyzed will be furnished by the œnotechnic station. This can not be placed upon the cask or case or bottles except by the representative or one of his employees, for whom he will be responsible.

8. The certificate of the analysis of each parcel of wine will be published in the bulletin of the local Italian chamber of commerce, and in case there is none such, a copy will be displayed in the office of said chamber and another in that of the œnotechnic station of the Italian Government. The possessors of such certificates may use them for purposes of advertising, but it is understood that they refer only to the parcel for which the certificates were obtained.

9. The wines certified pure are under the supervision of the superintendent of the station, and the technical operations that the importer may think necessary to permit upon the same in order to render them acceptable to the consumer, and for their better preservation, must be supervised by the Government representative, in order that nothing may be done to injure their character and healthfulness. For this reason the superintendent must have free access during office hours to the warehouses of merchants to whom these certificates are delivered, and if he thinks it necessary he may repeat the analysis without expense to the merchants.

10. The certificates of impure or defective wines in cask to use against the shipper will be delivered only for parcels of which the samples were taken by the Government representative on the wharf before the merchandise was put into the stores of the merchants.

11. It will be well for the importers who intend to have their wines examined by the œnotechnic station at the same time that they send their orders or acceptances of consignments, to transmit to the shipper a copy of these regulations.

12. The importers who ask from the Government office the analysis of their wines must at the same time make a declaration that they agree to accept the conditions established by these regulations. Any failure to comply with this stipulation will deprive them of the right to further application to the office and also of making use of the certificates previously issued.

A copy of these regulations will be posted in the office of the Italian chamber of commerce and of the Italian Government oenotechnic station in New York, and also in the offices of the importers, for whom the work is done, if they so desire.

The CHAIRMAN. I understand you to say that when wine comes here from Italy you follow those instructions?

Mr. ROSSATI. Yes; if the importer comes to me and wants an analysis and wants the goods stamped with an official guaranty of their purity, I analyze them and stamp them accordingly, provided the analysis shows them to be pure.

The CHAIRMAN. But you do not do it unless the importers want it done?

Mr. ROSSATI. No.

The CHAIRMAN. You give the goods a sort of character from the Italian Government?

Mr. ROSSATI. Yes, or a guaranty. It gives me pleasure to state as regards Italian wines that I have not found one of them adulterated. I may have occasionally found a wine a little out of condition, but not one adulterated. I assure you there is not one Italian wine imported into this country that is adulterated, and therefore I wish to take exception to a statement made here the other day by a very clever chemist, Dr. Wyatt, who stated that there was an enormous adulteration of imported wines. These adulterations in a great many foreign wines, aniline dyes, are used for coloring purposes.

The CHAIRMAN. I think you misunderstand the purport of his remarks. I think he said that they were adulterated after they were brought in here.

Mr. ROSSATI. The report I read said that he stated there were enormous adulterations of imported wines.

The CHAIRMAN. Well, he did not mean by that that it was done in your country.

Mr. ROSSATI. That remark would do great damage to imported wines if not corrected. I know very well the laws of my country for the protection of our trade, and we have very strict laws that punish not only with fines but with imprisonment anyone who adulterates wine. Wine is a staple article of consumption in Italy and we take care that it is made pure. Besides there is no incentive to adulteration, as wine is very cheap in Italy, so that there is no reason for adulteration.

An article that I find much adulterated is olive oil, which is chiefly adulterated with cotton-seed oil, but the adulterations are made chiefly in this country. The foreign packages and foreign trademarks are imitated, and the imitators do not have to pay duty or freight on the mixed article. You can not bring to law the people who make these adulterations, because they use fictitious names, and no individual's interest is specially affected, but the general interests are affected.

For instance, a man here puts up a mixture of olive oil and cotton-seed oil, and puts on the package the name of a firm that does not exist at all, abroad. I think it ought to be the duty of the Government to stop that, because it is a fraud on the consumer and also a loss to the revenue. In England anything like that would not be

tolerated, because they have there an act called "The Merchandise Marks Act," which prevents anything of that kind.

I do not condemn the consumption of cotton-seed oil as such, but it should be sold for what it is. It costs 30 cents a gallon, whereas olive oil costs \$1.40 a gallon. Of course, cotton-seed oil has not got the fruit qualities nor the hygienic qualities of olive oil.

The counterfeiting of labels and trade-marks is extensive. The counterfeiters will take an American wine and put on it the labels of a foreign wine.

The CHAIRMAN. We have had a good deal of evidence before us on that subject. We had before the committee yesterday one hundred or more different counterfeit labels. The wine men who import their goods feel that as they pay duty their competitors ought to pay duty.

Mr. ROSSATI. Yes. The foreign people engaged in this trade, and who suffer from these counterfeits, have no way of protecting themselves. If laws were passed which would secure correct labeling it would be good for the consumers, the people of this country, and would be only a matter of justice to the foreign maker of the article that is imported into this country.

I therefore favor the proposed pure-food bill—the bill called in the Senate the Faulkner bill and in the House of Representatives the Brosius bill. The provisions of that bill, while protecting the interests and health of American consumers, will undoubtedly be of great benefit to the legitimate import trade in all lines of alimentary goods and beverages that are subject to adulteration, imitation, or counterfeiting of trade-marks and labels.

As to olive oil, notwithstanding the fact that the production of that article is increasing, new countries having added their contribution to the supply—among these newcomers being the State of California—yet it is every day becoming more difficult to get this article pure; and notwithstanding the increasing demand for this most useful and healthy condiment, we hear of difficulties on the part of growers to sell their olive oil at fair prices.

What is the reason of this? It is because of the adulteration with other oils, especially, as I have said, with cotton-seed oil. The incentive to adulterate is great, because while, as already stated, the cheapest eatable olive oil costs, duty paid, at least \$1.40 a gallon, the cotton-seed oil can be had at only 30 cents. The production of cotton-seed oil, from almost nothing forty years ago, reaches now over sixty million gallons yearly in this country alone. Out of this great amount, do you ever hear of a drop of cotton-seed oil being sold by the retailer for what it is? Never. It is always sold either as salad or more frequently blended with a little olive oil, and sold as "olive oil."

Cotton-seed oil may be a useful article for a good many purposes, but as a dietary article is greatly inferior to olive oil, of which it does not possess the fruitiness or other hygienic properties. However, I should not complain of it if it were sold for what it is. The use of cotton oil as such by those who like it is not a thing that can be objected to. What I complain of and what I think unjust is that it should be sold as another article which costs five or six times as much, because then a fraud is committed on the consumer.

In Italy the adulteration of olive oil has of late been rendered much more difficult than in other countries of Europe by a high duty on cotton-seed oil, which reduces the profit of the operation, and if done at all it takes place in bonded warehouses.

But in this country such adulteration is practiced on a large scale.

Foreign tins and trade-mark designs are imitated and filled with mixed oil, which is then sold under a fictitious name, as "Sublime," "Extra Fine," or simply "Fine Olive Oil." These frauds are being committed with impunity, and are greatly prejudicial to honest trade. As the names used in such cases are purely fictitious, the operators of such frauds can not with existing laws be brought to justice, while it ought to be the duty of the Government to prosecute such cases in the interest of the commonwealth and in its own interest also, because the revenue loses money in this way.

Other articles that are subject to imitation and counterfeiting of trade-marks and labels, rather than to adulteration, are wines, liquors, cordials, soaps, etc. I think that the branding of similar goods made in this country in such a way as to induce the public to believe that they have been imported, or the refilling of a package used for foreign goods with a homemade article, is a fraud committed at the expense of the consumer, who should be given what he demands and not be imposed upon. This is also a cause of considerable loss to the revenue, which should not be tolerated any further. I understand that the Brosius and Faulkner bill proposes to do away with this evil, and protect legitimate interests in a legitimate manner. This bill should, therefore, be indorsed by all honest people.

An Italian philosopher of some centuries ago said: "Quid aliud sumus nisi ad ipsum unde alimur?" ("What else are we if not of what we feed upon?") It follows that we will have a better chance to keep pure, sound, and healthy when the purity of our food and drinks will be better looked after and controlled than it is at the present time. There is pure food enough in nature to feed many more millions than the present world's population, and we should insist on getting it pure and in obtaining the enactment of laws that will put a stop to the greed and malpractice of unscrupulous dealers. These, under the specious pretense of cheapening an article, or stimulating its demand, or preventing it from spoiling, slowly poison the people, undermining that remarkable health and energy of the American race which, combined with its firmness of purpose and intelligence, has made its name respected and feared.

Desirable as it is that in matters dietetic legislation should interfere as little as possible, it is nevertheless the supreme duty of the legislator to see that the liberty granted to commerce for the honest and vital purpose of competition should not degenerate into failure to afford that protection to which the people's health is entitled.

The motto of the Roman senators was: "Salus populi suprema lex esto" ("The health of the people must be the supreme law"). I hope that the Senators of a country none the less great will not make less of this principle and will use their influence and ability in legislating so as to prevent that injury to the public health that would result from the evils inseparable from adulterated foods and drinks.

TESTIMONY OF EDWARD H. JENKINS.

EDWARD H. JENKINS, sworn and examined.

The CHAIRMAN. Where do you live?

Professor JENKINS. In New Haven.

The CHAIRMAN. What is your business?

Professor JENKINS. I am vice-director of the Connecticut Agricultural Station.

The CHAIRMAN. What is your profession?

Professor JENKINS. I am an agricultural chemist.

The CHAIRMAN. Will you state briefly what training you have had.

Professor JENKINS. I was graduated at Yale University; took three years of graduate studies in the Sheffield Scientific School; took my doctor's degree there; studied one year in the University of Leipzig and the Forest School at Tharendt in Germany. Since 1877 I have been connected with the Agricultural Station in New Haven as chemist and vice-director. During the last four years I have been in general charge of the examination of food products under a State food law, the execution of which rests with the agricultural station.

The CHAIRMAN. Have you given the subject of food adulterations some attention in your studies and in your practice?

Professor JENKINS. I have. I had done so prior to the past four years; and of course during the past four years I have been required to give special attention to food products as they are found in the Connecticut market, examining a good many hundred samples each year of most of the food products which are on sale there.

The CHAIRMAN. I wish you would be good enough to state briefly some of the difficulties you have had, or at least some of the features of the work which it would be instructive for this committee to know.

Professor JENKINS. I have paid a good deal of attention to the subject of food adulteration for a good many years, and examined many samples from time to time.

It is my opinion that the amount of food adulteration in our State has increased (up to the present time at least) with business competition and the demand for cheap goods and the necessity for utilizing waste products. Cocoanut shells are no longer rejected, as they used to be, because they will make good spices. Such things as the hulls of pease, and such things as pepper shells are used in making spices. Prune stones we find used in making coffee. As to all those waste products there is an increasing tendency to introduce them into food products.

At the same time I think that the amount of adulteration which is distinctly and obviously prejudicial to health has decreased, owing to the increased activity of the health officers and inspectors. So that we may say that at the present time food adulteration is chiefly injurious in demoralizing honest trade, and in working petty frauds on the consumer, rather than being largely injurious to the public health. In our four years' experience in Connecticut we have only found a single article in any food product which we could say was distinctly and absolutely a poison, and that is Marsh's yellow, a dye used in very small amounts probably in the adulteration of mustard.

Of course there are the antiseptics, which are used pretty largely, about which there may be doubt.

It is impossible to give an accurate definition of the word poison. You may say that in one sense even the old-time antiseptics, salt, vinegar, and wood smoke, are to a certain extent poisonous—that is, they can be used in quantity or degree sufficient to work serious harm. Antiseptics are considered by some to be poisonous, whereas in small doses they may not be so, and certainly to certain persons in sound health are not at all injurious.

There are coloring matters found in catsups and some temperance drinks, about which there may be dispute as to whether they are poisonous or not in the doses in which they are administered.

If I may return to the subject of antiseptics, if you care for it I can

give you a brief résumé of some of the things we have examined and of the extent of the adulteration in them.

The CHAIRMAN. We should be very glad indeed if you would do so.

Professor JENKINS. Flour, which is the "staff of life," we have not found in a single case, in Connecticut, to be adulterated. We have examined some hundreds of samples, but never found a case of adulterated flour. In one or two samples, however, referred to us from other States for examination, we have found considerable quantities of corn flour. That is of course harmless, but it damages the baking quality and the eating quality of the bread.

The CHAIRMAN. If it is the corn flour that is the product of the glucose factory, the gluten and sugar being all out of it, it will be of very little value.

Professor JENKINS. It is a starch product. It has the same quality as starchy substances; bread will not rise so well with it.

The CHAIRMAN. And the gluten is largely out of it?

Professor JENKINS. Yes. You have heard the story of the starting of that industry, furnishing corn flour for the adulteration of white flour, and how it seemed to have been stopped by the Spanish war indirectly, which, if true, was one of its blessings in disguise.

The CHAIRMAN. There may have been something in that, but I will state for your information that a year and a half ago I introduced in Congress a bill which was passed and which put that description of flour under regulations similar to those concerning oleomargarine.

Professor JENKINS. Requiring a revenue stamp and branding?

The CHAIRMAN. Yes.

Professor JENKINS. That is undoubtedly what stopped the thing. The other was only a matter of rumor. I thought that that new law was ostensibly a revenue-raising measure, but it no doubt stopped that business.

The CHAIRMAN. So far as concerns the raising of revenue, I will state for your information that this particular measure does not yield enough money to pay for the collecting. I will also add that since its passage the Government has confiscated some 12,000 barrels of the stuff; and our exports have increased, you will be glad to know, by 50 per cent.

Professor JENKINS. I am glad to hear that.

The CHAIRMAN. And the evidence before the committee is that that is because we have established a reputation for making honest flour.

Professor JENKINS. Yes. If the thing had gone on it would have practically ruined our trade.

To continue my observations with reference to our tests: I will say that in the matter of beef we have not touched that article. There has been so much talk of "embalmed beef" that we thought other people might attend to that.

In one or two chickens brought from the West we found borax.

In sausages we found borax added as a preservative and in considerable quantity. In a number of determinations which we have made we have found 1 pound of sausages to contain from 8 to over 50 grains. That would be equivalent to seven-tenths of 1 per cent of borax.

Oysters are frequently treated with borax in considerable quantity. Out of 75 samples of fresh oysters we found 13 so treated, and in those we found from $5\frac{1}{2}$ to over 38 grains of borax to a pint of oysters. Oysters, as you know, are very perishable. They are used for food for invalids and must be very fresh. By treating an oyster with borax he will pass for several days as if in the bloom of youth.

We found cream frequently to contain borax.

Of molasses, we have examined a good many hundred samples for the dairy commissioner, who, curiously enough, is charged with the inspection of molasses, and we found that for an average of four or five years about 20 per cent of the New Orleans molasses and some sold as Ponce molasses (it is not confined to the New Orleans article) contained considerable quantities of glucose sirup. Some of the samples seemed to be made entirely of glucose sirup.

In the matter of lard, out of 162 samples examined we found only 36 of them to be adulterated. Of course there are substitutes on the market, which are sold under their true name or sold as substitutes, but outside of those about 36 per cent of those sold contain some cotton-seed oil and beef stearine.

Jellies are extensively adulterated; more than one-half of the samples that we have examined were so.

There is one firm which makes a number of brands of jellies—"orange," "strawberry," "grape," etc. They are all made out of starchy paste sweetened with glucose, flavored with artificial flavors, and colored with coal-tar dyes, and are kept from molding with salicylic acid. They may be called gems—works of art; they are preserves as distinguished from jellies. Very much the larger part are adulterated by the addition of artificial coloring matters, artificial flavors, or salicylic acid. We class as adulterated anything that contains these modern antiseptics.

Coffee has been very largely adulterated—I mean the cheaper grades of ground coffee. The coffee that is sold whole is not often adulterated. We have, however, found whole coffee containing crushed pease and chicory and artificial coffee, of which I shall speak later; but the ground coffees, selling for 25 cents a pound and under, have been extensively adulterated with chicory, with crushed pease, with artificial coffee, and with what we call "coffee pellets." Imitation coffee is wheat middlings or flour, and possibly a little gum, molded into cylinders, perhaps the size of the little finger, and roasted. Then that is crushed, and each fragment has the curve of the cylinder and does not look entirely unlike crushed coffee. Besides that, there are added pellets—pea hulls, which are made into pellets a little larger than pea heads.

There was formerly a firm that made artificial coffee beans. That [exhibiting] is an artificial coffee bean, the old "original" bean of the kind. Those beans contained no coffee, but they were molded and looked like the original thing. That business I judge is now unprofitable, for we no longer find them in the market. We got some of those from a bankrupt stock. There [exhibiting a bottle] is a coffee adulterated with pease, chicory, and imitation coffee.

The CHAIRMAN. This would require a microscopical analysis to determine that it was not genuine coffee?

Professor JENKINS. It would require either a microscopical analysis or the examination of some one thoroughly familiar with it. Our microscopist can pick it out pretty well by the naked eye, but has to fortify himself with a microscopical examination.

The CHAIRMAN. That looks like a coffee bean that has been molded?

Professor JENKINS. Yes; but a coffee man would spot that instantly. There is no crack on one side.

There [exhibiting another bottle] are pellets that are made of pea hulls, which are used for putting into ground coffee. There [exhibit-

ing another bottle] are Canada pease, roasted, which have been picked out from a sample of whole coffee.

Here [exhibiting still another] is what you would call an "imitation coffee," made from a wheat product—middlings or bran.

There [exhibiting another] is a jelly made of starch paste with glucose, colored with coal-tar dye, flavored with chemicals, and preserved with salicylic acid.

The CHAIRMAN. There is not even a seed in it.

Professor JENKINS. I have spoken of the adulteration of spices. That is a very petty fraud, but carried on on a large scale.

There [exhibiting a sample] is a sample of "Star Mills pepper." It consists of acids, charcoal, and some starch. That is furnished by the manufacturers of spice grinders' supplies—furnished only to the trade—furnished to meet the competition for a cheap article.

Here [exhibiting] is a sample of cayenne pepper, made by the same class of people. That is made of acids dyed, probably with an aniline dye. I have not tested for the dye. It is intended for cayenne pepper. I doubt if there is any cayenne pepper whatever in it; but it is used for extending the genuine pepper.

There [exhibiting another bottle] is a sample of mustard containing 20 per cent of plaster of Paris.

In 1896 we found over 80 per cent of the cheap ground coffees adulterated.

We publish each year in our reports the facts, such as where we bought the sample, whether it had any label, who the manufacturer was, and whether we found it adulterated or not. We let the facts be known. We distribute 17,000 copies of this report through the State of Connecticut, and have a great many inquiries from selling agents, who are quite willing to show up the sins of their competitors while holding their thumbs over their own. We have inquiries also from retail grocers. So our work in this line is a kind of "home missionary" work.

In 1897 of the coffees examined we found 70 per cent adulterated; in 1898 we found only 40 per cent adulterated, and in 1899 we found only 20 per cent adulterated.

We do not claim that all that improvement has come from the execution of our pure-food law, because the price of genuine coffee has, I believe, gone down very much, so that it pays less to adulterate it than it did, but we believe that part of that improvement is due to the publication of the facts with regard to food adulteration.

Beer we have tested only with regard to antiseptics. Out of 40 samples which we tested 29 were free from antiseptics and 11 contained salicylic acid.

As to ales, we examined only 7 of those. Of the 7 examined 6 were pure and 1 had salicylic acid, or at least 6 were free from salicylic acid and 1 contained salicylic acid.

We have a pretty efficient law with regard to adulteration of tea, and Japan also has one, I think; so that while we examined several hundred samples of tea we have not found one in which there was any evidence of the presence of thorn leaves. In one or two cases there were just a few leaves, but so few that they might have got in by accident. There was nothing that looked like adulteration.

Tomato "ketchups" are extensively made, as the labels say, "from selected ripe tomatoes," but it is largely the cores and the skins of the tomato that are so used. Those are cooked, strained, and sent in bulk to be dyed with eosin, a coal-tar dye, and preserved with sali-

cyclic acid or benzoic acid. Out of about 45 samples that we examined last year, I think 6 were free from antiseptics, 27 contained salicylic acid, and 8 contained benzoic acid.

In the case of olive oil we found about one-half the brands to be of pure olive oil, of a better or poorer quality, and about one-half were mixtures of cotton-seed oil or oil of sesame. Cotton-seed oil is also bottled as "salad oil," and makes a pretty fair salad oil for anyone who likes that kind of oil.

I do not know but that I have now given you a general idea of the extent of adulteration. We have examined a good many things.

As to temperance drinks, we have been examining those this summer with considerable interest. They are extensively dyed with aniline dyes and flavored with artificial flavors. Some of them are pretty good, and some of them are very bad. There is an artificial raspberry flavor—

The CHAIRMAN. Which smells like raspberry?

Professor JENKINS. Yes, it does; but I should distinguish it from the genuine. There is something about it that looks and smells like the original berry, but it is not that berry.

The CHAIRMAN. What is it colored with?

Professor JENKINS. With a coal-tar dye. It is made up from four different preparations, sent to us, or sent to an agent of the agricultural station, purchased for us from a company that is in the business of making these things. The different ingredients were sent to us and we followed the directions that come for making the thing up. It is a sugar sirup, to which is added a flavoring which is a vile thing in itself, but not bad smelling; then a fruit acid; then there is a foam which we have not examined. They make it of soapwort and white of egg and various things put in to make the mixture froth up in the cup.

I can not at this moment put my hand on some pieces of flannel which I had dyed from the dye contained in a glass of soda water. The quantity of dye that is contained in one glass of soda water would dye a piece of flannel four inches square a very brilliant aniline color.

I think that gives a fair idea of the condition of things in that one State (Connecticut). We feel that we have gone far enough to know the condition of adulteration matters there.

I should like to say a few words in regard to the use of antiseptics and our position in regard to them. There is a great deal of conflicting evidence with regard to their healthfulness, which, it seems to me, is totally irrelevant to the question at issue.

It is unquestionable that salicylic acid and borax are used in medicine, and recommended by physicians, and, we must believe, are valuable remedies in their place. So, also, they are used in food in very considerable quantities, and certainly take the place, as far as preserving food is concerned, of salt, and wood smoke, and vinegar, which were the old-time accepted antiseptics. I doubt whether they are any more poisonous than salt, wood smoke, and vinegar may be to certain persons. As I said before, a poison is a thing that you can not define. A thing is a medicine (that is, it is a good thing) in one dose; it is harmless in another dose; injurious in another dose, and a poison in another and larger dose. Strychnine is poisonous in certain quantities; so is arsenic. A person can poison or kill himself even with vinegar, if he takes enough of it. But it seems to me that that does not touch the point.

The point is this, that every man's system is a law unto itself, and the comfort of living depends largely for each individual upon his learning, by his own experience of life, what agrees and what does not agree with him. Two persons apparently in equally sound health are very differently affected by the same food. Sugar is a thing that I can not take to any extent without being made uncomfortable and even sick by it. Yet I had a man in my employ at one time who was cured of violent attacks of dyspepsia by taking large quantities of sugar.

There are many people who can not abide pickles; some can not abide wood smoke; some can not stand much salt food. The old-time preservatives and the modern preservatives are different in this, that in the old-time affair every person had information at once by taste and smell what he was taking, and he could tell from his experience whether it agreed with him or not. These modern preservatives are used without any notice given by the vender that they are used. That opportunity and right of the individual to find out whether they will or will not injure him is taken away from him. That, it seems to me, is the rational ground for requiring notice of the presence of these preservatives. Such notice should be given to the consumer.

I believe that preservatives may have their place in food—a legitimate place—but certainly they should not be used unless it is distinctly stated on the packages which inclose the food, or unless notice be given to the buyer by the seller that the preservatives are used. This information should be given in some way. It should be made known that they are present and in what quantity they are present.

Take the one article of oysters. We may all agree that borax is perfectly harmless; but here is a sample of oysters that contain 38 grains of borax in the pound. Here is an invalid with a delicate digestion, for whom fresh oysters are ordered by the physician. I do not believe that any reputable physician would prescribe that his convalescent patient should take 38 grains or any considerable fraction of that material in that way when he knew nothing of it.

The CHAIRMAN. That is, of borax?

Professor JENKINS. Of borax. It might work considerable disturbance in a delicate stomach, and I think that would be the opinion of a physician as to the case of an invalid lady, whereas when she was well she might be able to stand that dose without trouble.

In our own State the use of antiseptics was forbidden in the law, and then a provision was inserted further on which neutralized the effect of the prohibition. It was provided that when any matter or ingredient was added because the same was required for the protection or preservation of an article of commerce to put it in a fit state for carriage or consumption, then it might be used. So that if we find borax or formaldehyde the question now comes up, is it (the borax or formaldehyde) necessary to fit the article for carriage or consumption?

The CHAIRMAN. Would you recommend a national law in regard to the use of antiseptics?

Professor JENKINS. I am not enough of a legislator to feel competent to recommend anything in the way of national legislation. It is all a question of how far it is a matter for the General Government as distinguished from State governments to regulate these things.

But if it is deemed advisable that the United States Government shall pass a pure-food law, it seems to me certainly wise that such a law should forbid the use of antiseptics that are not evident to the taste and smell, unless their presence is called to the attention of the purchaser either in the label or in the sale of the article.

The CHAIRMAN. What would you think of having a national board under the direction of the Department of Agriculture—a national board or commission to be appointed by the President to fix standards of foods and to control the use of preservatives generally?

Professor JENKINS. I think that the fixing of standards for foods, or for certain foods, would certainly be a most desirable thing. As to the special means by which that could be accomplished I have not given the matter sufficient thought and I do not feel competent to speak. I think the thing is the right thing to be accomplished, and that such standards for certain foods ought to be fixed.

The CHAIRMAN. And you see the advantage, I suppose, of a national law as against State laws, because States might have conflicting laws, rules, and regulations on the same subject. A man may be a perfectly honest manufacturer and may send goods into your State marked in one way to comply with the laws of your State, and may have to mark or label them differently to send them into another State.

Professor JENKINS. Yes; there is that objection. Manufacturers would have to brand their goods in different ways in order to meet local regulations.

The CHAIRMAN. Have you any other suggestion to make to the committee?

Professor JENKINS. I think I have nothing more, unless you have some questions to ask.

The CHAIRMAN. I think I have nothing more to ask you, Professor.

TESTIMONY OF WILLIAM H. ZELTNER

WILLIAM H. ZELTNER, sworn and examined:

The CHAIRMAN. What is your business?

Mr. ZELTNER. I am a lager beer brewer in New York City. The concern is The Henry Zeltner Brewing Company.

The CHAIRMAN. Whereabouts?

Mr. ZELTNER. At 170th street and Third avenue.

The CHAIRMAN. How long have you been in the business?

Mr. ZELTNER. Do you mean how long our business has been established or how long I have been in the business myself personally?

The CHAIRMAN. I mean how long you have been in the business yourself personally.

Mr. ZELTNER. I have been in the business since my seventeenth year. That is to say, I have been in it for twenty-three years.

The CHAIRMAN. You are a practical brewer?

Mr. ZELTNER. Yes.

The CHAIRMAN. In your brewery, what do you use in the manufacture of beer?

Mr. ZELTNER. In one brand of beer, which we term old-fashioned beer we use nothing but barley malt and hops, and of course yeast and water. Those are the ingredients that we use in 75 per cent of the beer that we make to-day—about that.

The CHAIRMAN. Do you make any other grade of beer besides that?

Mr. ZELTNER. Yes.

The CHAIRMAN. Of lighter color, is it?

Mr. ZELTNER. Yes.

The CHAIRMAN. What do you use in that?

Mr. ZELTNER. I use the best of white corn grits.

The CHAIRMAN. Does that make a lighter-colored beer?

Mr. ZELTNER. Yes.

The CHAIRMAN. You have some customers who prefer that?

Mr. ZELTNER. Well, I use it to meet competition. Some customers want a lighter beer because I can and do give it to them cheaper. The cost of production is less.

The CHAIRMAN. Do you use any preservatives—any salicylic acid or other preservative?

Mr. ZELTNER. No, sir; I have got salicylic acid on hand for any beer that may go out of the country, as I understand from people who want beer in some other countries that the beer must be bright and keep for probably an indefinite time, we do not know how long. For purposes of that kind probably salicylic acid would do.

I should like to state that I will speak on the turbidity that may arise in beer at certain stages. By turbidity I mean that condition in the beer when it becomes cloudy; and if a note be made of that I will explain it later.

The CHAIRMAN. You may proceed with that subject now if you desire.

Mr. ZELTNER. Well, I have my argument formulated somewhat and should prefer to speak first on the subject of a standard for the production of lager beer.

The CHAIRMAN. You believe there ought to be a standard?

Mr. ZELTNER. Yes; for various reasons.

The CHAIRMAN. A standard fixed by national law?

Mr. ZELTNER. Yes. And there is another point that I should like to touch upon in the argument, and that is this: It is well known that the renown of the Bavarian beers has placed the brewers of Bavaria in an enviable position as brewers.

The difficulties that would probably occur if we had State laws have been put to me, and without giving it much consideration I have thought that there might be some plausibility in that view of the case.

I am of opinion, however, that if the brewers of any particular State—I do not care what State it is—would establish a standard for that particular State, the brewers of that State would be in the same position (and it would not take a very long time to bring them there) as the brewers of Bavaria. It is a well-known fact, I believe—and I can prove it by documents, which, however, I have not with me at this moment, but if anybody should doubt the statement or contradict it, I can prove it—that the countries making up the German Empire outside of the State of Bavaria have petitioned their governments for just such laws as prevail in Bavaria to-day.

The CHAIRMAN. What standard would you be in favor of fixing, Mr. Zeltner, and how would you fix the standard?

Mr. ZELTNER. I would base the standard on malt. Malt should be the standard.

The CHAIRMAN. That is barley malt?

Mr. ZELTNER. Yes, sir; and the degree of inferiority or, as we would say, adulteration would be determined by just the percentage of other cereals that are used in place of barley malt; because I maintain that cereals other than barley malt in the production of lager beer are used for no other purpose than to make a cheaper article. That is easily proven by simply taking a lead pencil and a piece of paper and doing some figuring.

The CHAIRMAN. Corn is, of course, cheaper than barley malt?

Mr. ZELTNER. Yes.

The CHAIRMAN. It also has the effect, does it not, of making a lighter color?

Mr. ZELTNER. Making a lighter color to the depreciation of taste. You get a lighter color and probably a greater durability, as some of our chemists say, but you are doing it at the cost of the flavor and the nourishing qualities which malt contains.

The CHAIRMAN. Corn is nutritious, is it not?

Mr. ZELTNER. It is not so nutritious as malt. There are certain products in malt the nutrition of which products has been known, not for six months or the last few years in which brewers have resorted to other cereals, but for centuries. In support of that I can bring the testimony or the opinions of those very gentlemen who uphold the superiority of other cereals, as they say. They say that beer is better—sweeter and more wholesome—if made out of other cereals than malt. That is, they tell you committees, and the public in general, that it is so, but they forget that when they talk to brewmasters and brewers who know about the art of brewing practically they almost state substantially what I say to your committee.

The statement has been made here by one gentleman, I believe—if I am not correct I desire to be corrected—that if brewers were to resort to malt only for the production of their beers, there was not enough barley grown, or that enough could not be grown to supply that amount of malt—that barley of a sufficient quality to make malt suitable for producing beer could not be got.

The CHAIRMAN. Speaking from memory, I think one gentleman said that there was not enough of the right quality now produced; but I think that Mr. Liebman stated that at the present time they were raising plenty of good barley in this country.

Mr. ZELTNER. And can raise more. Anybody who knows the available territory in this country that is suitable for the production of barley knows that.

I believe it was stated also that barley malt and hops of proper quality and quantity make a tenth part of the beer consumed in the world. What are we to assume from that—that 90 per cent of the cereals used for making beer are other than malt? If that was stated it is clearly wrong. It was stated also that in standard beers only 15 per cent of glucose is used.

Another point: The encouragement of the planting of barley and the brewing of malt is a benefit to the American farmer. He gets a better price for his barley than he would for corn.

Suppose it were necessary to raise from 30,000,000 to 50,000,000 bushels of barley more in this country than we raise to-day—and we have an abundance of barley—the brewers need not fear that there would be any scarcity. Of course corn is produced by the hundreds of millions of bushels, and an increase of thirty or fifty million bushels of barley would be only a drop in the bucket.

I will state here that the production of barley in the State of New York which at one time was up to 5,000,000 bushels is now but about 2,000,000 bushels.

The CHAIRMAN. That is true largely as to all cereals, is it not? The New York lands are more largely used now for dairy and milk purposes and the Western farmers can raise cereals more cheaply.

Mr. ZELTNER. I think that if there were a demand here they would go back to the planting of barley.

The CHAIRMAN. I should like to ask you a question at this point on the matter of a standard of beer. The word "Kaiser" was used yesterday by one of the witnesses in that connection. It seems that there are two different standards of saccharometers, one being the

Kaiser and the other the Balling. They are used to measure the amount of saccharine matter or malt extract in the beer.

Will you now kindly look at the paper which I show you, entitled "Chemical combinations of standard beers." I do not ask you to state accurately but to state from your memory whether that is about the percentage of each of the different articles that ought to be in a beer of proper standard?

Mr. ZELTNER. I see the word "extract" in this list. Does that mean the finished beer?

The CHAIRMAN. It means the finished beer.

Mr. ZELTNER. I see by this list that it gives lager beer 3.93 per cent of alcohol. That is nearly 4 per cent, and of extract matter 5.79. That ought to make a good lager beer. But it all depends. There is a way of getting at that. The only way of getting at it is the quality of your malt—using malt for a standard; and that is where the art of brewing comes in—not theoretically, but practically.

The CHAIRMAN. You could brew a beer up to any of those standards, could you not?

Mr. ZELTNER. Yes; but I would have to know what I could get out of any particular malt. For instance, I may take a malt sample that may look just as well as another sample—probably better. There may be a larger percentage of extract from the better-looking malt, but extract not of that quality as the other malt. That difference is produced by the method of germination or the method of kilning, or the malting method. The grade depends upon that.

I maintain that lager beer produced out of malt only, out of a carefully malted barley, makes the better beer and it is more wholesome and, to use the exact words of a chemist who sometimes gives ideas opposite to those that I am giving now, it is a beer that agrees better with the consumer. That he so stated I have the proof. Now, if any article agrees better with you, you must certainly come to the conclusion that it is the better article. I am not alone in some of my ideas. There are other brewers who claim that the scientific stations, so called, are the real cause of the demoralization now existing in the lager-beer business.

The CHAIRMAN. What do you mean by scientific stations?

Mr. ZELTNER. The scientific stations are the institutions that are under or governed by such gentlemen as Dr. Schwarz and Dr. Wyatt. I also claim that they are largely responsible for malsters becoming indifferent as to the quality of malt that they produce, simply because the brewer wants to buy as cheaply as he possibly can buy, and, as I stated before, it is not the amount of extract in the grain, but it is the quality of the extract that an honest brewer who tries to brew an honest beer should look for. That there is a difference in the extract produced in these malts I will also prove by the words of this very gentleman. I believe that I am quoting right—I want to be as nearly correct in what I state as possible.

The CHAIRMAN. From whom do you wish to quote?

Mr. ZELTNER. From an address of Dr. Schwarz to the brewmasters in convention at Detroit in 1897.

The CHAIRMAN. Can you leave that address with the stenographer to copy?

Mr. ZELTNER. Yes; but I simply want to—

The CHAIRMAN. If there is anything in it that you specially want to call attention to in a brief way we shall be glad to have it.

Mr. ZELTNER. Dr. Schwarz, in that address, says: "I wish to state

right here that I do not ascribe any special nourishing value to the presence of these substances in beer," meaning the albuminoids.

The CHAIRMAN. Do you wish to have this paper go into the record?

Mr. ZELTNER. I would like to have it all go in. I will submit the whole of this address of Dr. Schwarz to the brewmasters.

The CHAIRMAN. The stenographer will take it and have it printed in the record in full.

Mr. ZELTNER. There is another thing that I wish to mention before concluding. I referred to it in my opening remarks. That is in regard to the phenomena in beer which I call turbidity, or its becoming cloudy.

The CHAIRMAN. Yes, I remember you mentioned that.

Mr. ZELTNER. I wish to state that in a healthy lager beer at a given temperature—at a certain low temperature—the beer will become turbid or cloudy. The ordinary beer drinker or any person not conversant with the reason of that cloudiness may reject the beer for the reason that it does not look right; it does not appeal to the eye.

I can take that same beer and bring it back into a higher temperature and it will again become bright as before.

Now, we know that from practice. The theory of it is probably that the albuminoids contained in that beer become congealed at a certain temperature—they become frozen—and as the temperature of the beer is raised they again become soluble.

So that if that bottle of beer which was bright and, being put in a cooler, froze down, should be rejected on account of its being off color, you are doing an injustice to the beer, because that beer is just as wholesome as it ever was.

You will find that a beer is advertised as being able to stand any temperature. Of course it will stand any temperature. It is devoid of the nourishing constituents that make up the genuine malt beer. In the same way, if beer is thoroughly fermented—and it all depends on the usages of a beer—what it must undergo in the way of changes of temperature—if it does not undergo frequent and rapid changes of temperature, that beer will stay in sound condition as to appearance longer than it would if there was a change.

Now, I really believe, and I have experienced it, that that beer, even if it does not appeal to the eye on account of its apparent cloudiness, is far more healthy to drink than a beer that is kept bright to the eye with antiseptics, especially those that we know nothing about. Put that same beer into a mug (different from a glass); you can not see what is in it, but leave the matter to your palate and to the effects produced afterwards on your system, and I believe that that beer would be taken in preference to a beer that is kept bright by the use of antiseptics.

The CHAIRMAN. You think that beer ought to be made for the stomach and not for the eye?

Mr. ZELTNER. Yes. I would like to add one thing more, and that is: I can not understand why brewers, if they had perfect faith in the product produced by cereals other than malt, should object to letting the public know what that beer is made of, if their arguments are true that it makes a better beer than that produced out of malt. That is one of the principal things to be got by having a standard. Suppose that some of those cereals are wholesome, or as wholesome as malt, used to a certain percentage; that does not stop the brewer from using it in a larger percentage than would, in smaller percentage, be wholesome.

The CHAIRMAN. You think that by fixing a standard the people would know what was in it?

Mr. ZELTNER. Yes.

The CHAIRMAN. Would you favor the Bavarian system, which fixes the revenue on the amount of barley used? For instance, there, as I understand it (I have not a copy of the law), the revenue agent collects a tax on the amount of barley that goes into the brewery.

Mr. ZELTNER. I do not understand the revenue laws of Germany. Bavaria is only a part of Germany.

The CHAIRMAN. I understand that, but I was speaking only of Bavaria.

Mr. ZELTNER. Whether the revenues of Germany come from the use of malt or not I do not know.

The CHAIRMAN. We have been told here by gentlemen who appear to be well informed that the revenues are fixed in that way. The revenue official stays there and sees how many bushels of barley enter, and states that from that quantity they must produce only so much beer; that is as I understand it, and in that way they keep the beer up to the standard.

Mr. ZELTNER. That applies only to Bavaria.

The CHAIRMAN. Yes; I do not think that that is the law in all the German states, although it may be. I have not read the law myself.

Mr. ZELTNER. That is something that I have not given thought to.

I should like also to state here that the yeast produced by the use of malt only is a better yeast and more wholesome and more sought after by brewers who know their business. In support of that I will say that I have a letter here, which is in German, and which the committee are welcome to if they desire to translate it.

The CHAIRMAN. If you desire to leave it it can go into the record. By whom is it signed?

Mr. ZELTNER. It is signed by a brewmaster and addressed to our foreman.

In support of that I have evidence also by Dr. Brush, for instance, who is the manufacturer of the renowned Kumyss, who uses brewers' yeast in the production of his Kumyss, and uses no other yeast but ours.

The CHAIRMAN. You mean American yeast?

Mr. ZELTNER. I mean malt yeast produced in our brewery.

TESTIMONY OF J. FANNING O'REILLY.

J. FANNING O'REILLY, sworn and examined.

The CHAIRMAN. What is your business?

Mr. O'REILLY. I am editor of a publication in the wine and spirit trade, called The Liquor Trades Gazette.

The CHAIRMAN. Your experience in regard to liquors is largely from a literary point of view and from observation?

Mr. O'REILLY. Yes. I am not an expert.

The CHAIRMAN. You are not a chemist?

Mr. O'REILLY. No. My knowledge on the subject is derived from the fact that I am the editor of a trade publication.

The CHAIRMAN. Do you believe that there is a good deal of adulteration in whisky?

Mr. O'REILLY. Not so much in whisky, I think, as there is substitution.

The CHAIRMAN. What is substituted, in your opinion?

Mr. O'REILLY. We have a difficulty to contend with in the trade in the fact of new whiskies being sold as fully matured whiskies. There are certain processes by which that operation is brought about, but I do not think that in it there are any deleterious substances used particularly, except possibly in the matter of coloring.

The CHAIRMAN. Does aging whisky change its color?

Mr. O'REILLY. Yes.

The CHAIRMAN. I mean the natural aging?

Mr. O'REILLY. Yes.

The CHAIRMAN. Does it make it darker or lighter?

Mr. O'REILLY. Darker.

The CHAIRMAN. They have a process then of coloring new whisky so as to make it look like old whisky?

Mr. O'REILLY. Yes.

The CHAIRMAN. And you think that is not fair?

Mr. O'REILLY. It is not fair to the public.

The CHAIRMAN. Nor to the men who make good whisky?

Mr. O'REILLY. No. It is not fair to the honest manufacturer or to the consumer. Neither is it fair to the Government, which loses storage on it while it is aging.

The CHAIRMAN. What remedy would you recommend so that the honest distiller who ages his whisky will not have to compete with the man who sells new whisky, by the aid of coloring, for old whisky?

Mr. O'REILLY. I think the passage of a law which would make it imperative that the constituent elements should in a general way be shown on the package. Every package of whisky should be stamped either by label or brand. I should not suggest that a man should stamp his entire formula, but that he should give a reasonable percentage of his ingredients, so that the public or the purchaser would know that they are being fairly treated.

The CHAIRMAN. What is used for coloring matter?

Mr. O'REILLY. For aging whisky they use prune juice a good deal.

The CHAIRMAN. That is not deleterious to health, is it?

Mr. O'REILLY. I do not think so.

The CHAIRMAN. What is meant by the term "Straight" whisky?

Mr. O'REILLY. "Straight" whisky is whisky as it comes from the distillery.

The CHAIRMAN. And what is meant by the term "Compounded" as applied to whisky, or "Blended" whisky?

Mr. O'REILLY. "Compounded" whisky is original whisky to which has been added spirits; that is my understanding of it.

The CHAIRMAN. "Spirits;" that is, pure spirits? What they call "Cologne spirits?"

Mr. O'REILLY. Yes; it is a cheaper product than matured whisky. It is added to that in order to lessen the cost.

The CHAIRMAN. What would you say to a law that simply compelled a man to have a certificate that his whisky had been stored for a certain number of years, say five years, and absolutely prohibit the sale of fresh or raw whisky? Would that be a hardship?

Mr. O'REILLY. There are a number of people watching for schemes of arranging whisky so that it can be sold in new condition and still be as good as whisky that has taken years to mature. As I understand, there are several things resorted to. Some of the processes have been patented; for instance, the application of electricity to whisky. I have seen numbers of articles on the subject, but not being interested,

I could not say how near they have come to the result at which they aimed.

The CHAIRMAN. Then it is also claimed, I believe, that the putting of a barrel of whisky on a moving machine has a tendency to ripen or mature the liquor; for instance, that in the case of whisky placed on shipboard, sent across the ocean and brought back again, it is claimed by some that the gentle movement has a maturing or ripening effect on the whisky. What do you think as to that?

Mr. O'REILLY. I presume that the more the whisky comes in contact with the barrel, the barrel being burnt on the inside, the better the coloring process would result.

The CHAIRMAN. The barrel being charred on the inside for the purpose?

Mr. O'REILLY. Yes. The United States Government, as you know, passed a bottle-in-bond law, by which the liquors bottled under that law bear a Government stamp and are 100 proof, absolutely without any adulteration. That whisky is bottled under Government supervision, and the United States Government stamp is over each bottle. That, I think, has been generally regarded as a failure; I do not know why. It was an innovation. So far as this market is concerned, there is very little of it sold here for the reason that people here do not fancy liquor that is under proof; they prefer something that is about 85 or 90; and in this market there is a preference for blended whisky, consisting of the products of several distilleries blended together.

The CHAIRMAN. Then it may be all pure whisky. They do not blend rye and corn whisky, do they?

Mr. O'REILLY. If a rectifier is satisfied that he can get a food brand by such combination as pleases the palate, he will have a private label made for it, or private brand.

The CHAIRMAN. Your idea would be to have the Government fix matters so that the barrel would be stamped when it is blended so as to show the constituent elements?

Mr. O'REILLY. Yes; without encroaching on the privacy of any desirable formula that any rectifier or distiller may have.

The CHAIRMAN. What do you mean by a private brand whisky?

Mr. O'REILLY. A brand established by a man who is not a distiller, who is a blender, and in blending fixes upon a name and uses it. His formula is an original brand from an original whisky. A rectifier may get some original whisky and get some "James E. Pepper" whisky and mix the two together and find that they make a good blend, and he determines upon a name for it and it goes by that name.

The CHAIRMAN. Have you had occasion to look up the subject of beer adulterations?

Mr. O'REILLY. I have been present at some investigations on the subject before the New York State senate.

The CHAIRMAN. What do you think ought to be done in regard to that?

Mr. O'REILLY. I think that the brewers generally are in favor of a national standard. I have attended a number of brewers' conventions, when the question has been brought up, and I think that rather than face the troubles that would result from State legislation they would be willing to have a national law fixing a standard for the country. The idea is that State legislation would conflict with the interstate law. For instance, if we had a law in this State that prescribed a certain standard, that standard might involve an additional

expense in production, while the manufacturer of beer in New Jersey might come in here and sell a cheaper beer.

The CHAIRMAN. What do you say regarding the adulteration of liqueurs and cordials? Do you believe there is much of that?

Mr. O'REILLY. That is a matter that would have to be decided by particular experts. I could not say anything specific on the subject unless I were a chemist and were able to judge of the effects of certain acids and pigments that are used in the preparation of some of these goods by some houses. There is one matter to which I wish to refer—

The CHAIRMAN. You mean the matter treated of by the little book you hold in your hand?

Mr. O'REILLY. Yes.

The CHAIRMAN. Can you let me have that book?

Mr. O'REILLY. Yes; I will let you have it. (Delivers the book to the chairman.)

The CHAIRMAN. This little book is entitled "Valuable information for the manufacture of liquors without distillation." It is also called "A treatise on how to make liquors without distillation, and many other matters pertaining to liquors and their manufacture." The title page says that "This work is designed more expressly for the information and guidance of those engaged in or about to become engaged in the liquor, hotel, or saloon business." And further it assures us, on the title page, that "A careful perusal of its contents will repay the reader."

I will read an item or two from this book to exhibit the general character of its contents.

Under the general head of "How to make liquors without distillation" and under the special head of "Bead for liquors," it goes on to describe what a bead is. "A bead," it says, "is composed of one or more small white globules found floating on the surface of any liquid that has been subject to agitation, and is supposed to denote the strength of liquors." It goes on to describe how a "bead" can be given to liquors, and mentions the first description of bead as being derived from alcohol; the second as being derived by filtering the liquor through a liquid containing certain substances. The third description is what I want to have specially placed on our record. As to that sort of bead, the book says:

The bead derived from the third source is a chemical compound resulting from a chemical combination of sweet oil and oil of vitriol, say by mixing drop by drop 20 drops sulphuric acid with 30 drops sweet oil.

Farther along, in the same connection, it says:

To prevent a failure in the above preparation, owing to adulterated sweet oil being used [that is a sad reflection on adulteration], which has become so plentiful in the market, any oil that will stand the following test will answer: Mix equal portions of nitric acid and sweet oil, etc.

And so forth. Then it goes on to provide methods for "increasing the volume of whisky, etc., from 20 to 40 per cent without loss of strength;" also methods "for giving body, age, and mucilaginous oily appearance to wines and liquors."

I find in this book also a method for the manufacture of Scotch whisky, which I will read:

Thirty-nine gallons rectified whisky, half-gallon tincture grains of paradise, 3 ounces of powdered catechu. Color lightly with burnt sugar and add 30 drops creosote.

I am very much obliged for this book, which I shall be glad to keep for the use of the committee.

Mr. O'REILLY. In relation to the question of liqueurs and cordials, there is a very large demand for such goods here; and in past years foreign houses shipped very large quantities of them. But I wish to establish an affinity between your work, on this committee, and the subject of trade-marks. I think the public recognizes that there is such relation.

The CHAIRMAN. Yes.

Mr. O'REILLY. There are quite a large quantity of liqueurs and cordials made in this country, but there is only one house that I know of that puts these goods up under their own name. That is the house of Rheinstrom Brothers, one of whom was here yesterday and testified. The goods of that establishment give evidence that they are manufactured in this country. The other houses, seemingly standing high in the trade, too, put up these cordials under foreign names, some French names and some German names, as the case may be. These carry on their labels the idea of a foreign production; so that it is a deception. In addition to that it displaces the imported article and lessens the Government revenue from imports.

At the bar of this hotel there is to be seen a case of cordials with a foreign-looking label on it, Somebody "et Frères." Whoever gets a glass of that cordial naturally thinks it is an imported article, if he judges it by the label; as I say, that displaces so much revenue to which the Government is entitled, so much import duty. I believe our country is in a position to-day to produce high-class goods of that kind, and I do not believe it will ever be accomplished while our manufacturers operate on that basis.

The CHAIRMAN. You think that that ought to be also under Government supervision?

Mr. O'REILLY. Yes. That is my idea. There is a decided affinity between the question of trade-marks and that of substitutions.

The CHAIRMAN. What the trade-mark law does not reach the pure-food legislation could reach, you think?

Mr. O'REILLY. Yes.

The CHAIRMAN. There was an Italian gentleman here this morning, who spoke to us of fictitious firms and fictitious names on labels. For instance, if a man is making a fine cordial, called "Smith's Cordial," which comes to have a high repute, and if another starts in to make what he calls "The Jones-Smith Combination Cordial," there is no one to prosecute him, because there is no such firm as that whose name he is using?

Mr. O'REILLY. Exactly.

The CHAIRMAN. And what you wish this committee to understand is, that there are cases which the copyright law does not reach which could be reached by a pure-food law?

Mr. O'REILLY. Yes.

The CHAIRMAN. And that there ought to be a way of reaching these fictitious cases?

Mr. O'REILLY. Yes. In my capacity as editor I have known of houses that place on their labels the word "Paris," or "Bordeaux," and when I have asked them why they did not use their own name instead of a foreign name, they have said that that was the name of "a man who used to be connected with us on the other side, and we have the authority of the French Government to use that name." I regard that as nonsense, and a mere subterfuge.

Some time ago I wrote to Mr. Albion Tourgée, our consul at Bordeaux, to inquire whether a party of whom I had heard as living in Bordeaux was really there, and he replied that there was no such person there. That was as to a "Creme de Menth" manufactured in this city.

There is one house here in New York—a Canadian house—that has been very active in the pursuit of the falsification of labels. They are the proprietors of "The Canadian Club Whisky," the firm of Hiram Walker & Sons, Limited. Here are 33 samples of labels, all made in imitation of their Canadian Club Whisky, not one of which is genuine.

The CHAIRMAN. I suppose there are some of those that they can reach under the trade-mark law?

Mr. O'REILLY. They have done so. Their method of stopping that sort of thing is very distinct. When they find a man in a certain town imitating their whisky they have large placards posted all over the town saying "Citizens of such-and-such a town: You are being swindled. So-and-so is selling you an imitation whisky and is imposing on you." They have been very successful in fighting these imitations in that way. There is probably less now than there has been. While sitting here, however, a New York agent for the firm of William McGarrahan & Sons sent me a clipping from the Brooklyn Eagle saying that a man was arrested for selling raw spirits for familiar brands; that his house was full of the stuff, and that he had material for counterfeiting labels, besides bottles and packing cases. The man had been buying empty bottles of the brands he wanted to counterfeit, and putting his own cheap stuff into them and selling it for the genuine. He went so far in his rascality as to send to Europe for new capsules, so that the bottles could be refilled and be furnished with new capsules. That might have gone on for some time if he had not been discovered.

The CHAIRMAN. We are much obliged for your testimony, Mr. O'Reilly.

The committee adjourned till Monday, November 20, 1899, at 10.30 a. m.

COMMITTEE ON MANUFACTURES, U. S. SENATE,
IMPERIAL HOTEL, NEW YORK CITY,
Monday, November 20, 1899.

TESTIMONY OF HENRY O. HAVEMEYER.

HENRY O. HAVEMEYER, sworn and examined.

The CHAIRMAN. Please state your occupation, Mr. Havemeyer.

Mr. HAVEMEYER. I am president of the American Sugar Company. I am a merchant.

The CHAIRMAN. This committee is investigating, under authority of a resolution passed by the Senate, the question of adulteration of foods. Some of these adulterations are alleged to be deleterious to health and some are mere commercial frauds upon the consumer. You are familiar, are you not, with the manufacture of the article made by your company?

Mr. HAVEMEYER. I am.

The CHAIRMAN. You feel that you know it practically from the purchases to the sales?

Mr. HAVEMEYER. I do.

The CHAIRMAN. What do you use in manufacturing sugar?

Mr. HAVEMEYER. We use raw sugar of different grades of quality from the purest to the most impure, and the business is to extract and sell the raw sugar in an absolutely refined and pure state.

The CHAIRMAN. What ingredients do you use, if any, besides the raw sugar in order to make the product?

Mr. HAVEMEYER. We use none whatever.

The CHAIRMAN. You use the system that has been described here before the committee, I suppose, of dissolving the sugar and in that way cleansing it of impurities, running it, as I suppose (as I think one gentleman testified), through a series of cloths, taking out certain impurities, and them through charcoal?

Mr. HAVEMEYER. Yes.

The CHAIRMAN. Do you know of any ingredient in the shape of acids, lime, or anything of that kind that becomes a component part of the finished product?

Mr. HAVEMEYER. I do not.

The CHAIRMAN. You do not know of anything that goes into the process, that becomes a part of your finished product, that you would consider deleterious to public health in any way?

Mr. HAVEMEYER. There is nothing whatever of that kind.

The CHAIRMAN. Does the manner of refining and disposing of the product now differ from what it was some years ago?

Mr. HAVEMEYER. Not that I am aware of.

The CHAIRMAN. As I understand, the refiner sold his product and there was a custom of mixing different grades of sugar by the middle men or merchants who would have them both on hand. Did you ever hear of such a practice in the past?

Mr. HAVEMEYER. Yes; about fifteen years ago there was such a practice, owing to the cheapness of glucose, which was used as an adulterant in those grades of sugars commercially known as coffee-sugars, but I think that did not succeed and was entirely abandoned.

The CHAIRMAN. Under the practice now the refiner practically sells his goods and they go in the original packages to the retailers, do they not?

Mr. HAVEMEYER. Yes.

The CHAIRMAN. And they frequently go to the home of the consumer in the package or barrel just as it leaves the factory?

Mr. HAVEMEYER. Within the last two years there has been a marked change in the form of package. It was put up formerly in large bags holding 100 pounds and in the customary barrel, but it is now put up in 1 and 2 pound packages and reaches the consumer without any change of form.

The CHAIRMAN. The company that you represent and the company known as the Arbuckle Company—those two make the larger proportion of the sugar that is consumed in this country, do they?

Mr. HAVEMEYER. I do not think that Arbuckles count, when compared with other companies, outside the American Company. There are six or seven other companies.

The CHAIRMAN. I do not wish to pry into your business, but I desire when I report to the committee on this question, as to sugar, to show that I have covered by my questions the greater proportion of the sugar supplied to the people of this country. I therefore ask you to

state, if you will, what percentage you think these companies mentioned refine for the trade of this country.

Mr. HAVEMEYER. I think the Arbuckles refine about 5 per cent and the other companies about 25 per cent. The "trust," or American Company, refines about 70 per cent. These figures, of course, I give without any positive knowledge on the subject.

The CHAIRMAN. An estimate is all I ask.

Mr. HAVEMEYER. That is as near as I can get at it.

The CHAIRMAN. So far as you know and believe, as a practical sugar manufacturer, do the refiners of the other 30 per cent use practically the same system in the manufacture of sugar as you do?

Mr. HAVEMEYER. Yes.

The CHAIRMAN. And you know of no process and no practice among your competitors whereby their product is adulterated?

Mr. HAVEMEYER. No, sir.

The CHAIRMAN. You never heard of any?

Mr. HAVEMEYER. No.

The CHAIRMAN. You think that your competitors have the same sense of commercial honor, so far as the product is concerned, and that they produce the same goods as your company.

Mr. HAVEMEYER. I think their goods are absolutely pure. I should like to state in that connection that anyone who desires to test the product can do so by adding to it a little water. If it dissolves, it is sugar. If it does not dissolve, it is not sugar.

The CHAIRMAN. That is a very simple test, certainly. I do not know that I think of anything else to ask you, but shall be glad to hear anything that you may wish to say on the subject under consideration by the committee. Do you know anything of any other food products?

Mr. HAVEMEYER. No. I will say that I am in hearty sympathy with the idea of having the consumer protected under Congressional action, because there is no way in which a consumer can protect himself, that I am aware of, against food adulterations, and the subject should be a matter of national legislation.

TESTIMONY OF SIGMUND HOCHSTADTER.

The CHAIRMAN. I have received a letter from Mr. Sigmund Hochstadter, wholesale dealer in liquors, and secretary of the Charles Jacquin Company, manufacturer of cordials, No. 227 Front street, New York, regarding a statement made by Mr. Sadler, who claimed that \$6,000,000 was lost to the Government by reason of the imitation of labels, etc. The letter is as follows:

NEW YORK, November 17, 1899.

COMMITTEE ON MANUFACTURES,

United States Senate, Washington, D. C.

GENTLEMEN: Sigmund Hochstadter, wholesale dealer in liquors, and secretary of the Charles Jacquin Company, manufacturer of cordials, member of the executive committee of the Wholesale Liquor Dealers' Association of New York, appears before the Senate committee in the investigation of the subject of pure-food legislation; begs to state that he has read the statement made by Mr. George B. Sadler, of Bonfort's Wine and Spirit Circular, who claims that \$6,000,000 is annually lost to this Government by reason of imitation of labels and inferior products by liquor dealers in this country, which statement can not be substantiated.

It is true that the sale of imported goods would be increased to some extent if the duty was reduced, to the detriment of the home industries.

The manufacture of cordials and liquors in this country is in quality equal to the best imported, and in many instances superior.

It is suggested that our time can not be given to legislation in the direction indicated by Mr. Sadler, but it is nevertheless a fact that the wines and liquors sold in this country must be, and are, as pure in quality as the imported. The wines and liquors of American production are purer and more wholesome.

It is suggested that the subject brought up by Mr. Sadler more properly belongs to the trade-mark law than to the pure-food legislation.

So far as legislation in the direction of pure food productions is concerned, I venture to suggest that American dealers in either foreign or domestic wines and liquors should be compelled to put their names upon every bottle or package sold or put up by them for sale as a means of identifying them in case of any impurity.

Of course it is evident that we can not reach the foreign distiller or manufacturer, but we have jurisdiction over the consignee or representative of that manufacturer or distiller, and he (the agent) should attach his name and address, to be held responsible for impurities. Thereby we can reach the foreign manufacturer or distiller.

Mr. Sadler speaks, no doubt, in the interest of the foreign distillers and would have legislation adopted, if possible, to favor them; and it is respectfully submitted that this style of legislation would not prove beneficial to the American Government or to the American manufacturer or distiller.

Would also ask to be permitted to submit, by mail or otherwise, within a few days an article upon the kindred questions heretofore taken up by Congress.

Yours, very respectfully,

S. HOCHSTADTER.

SIGMUND HOCHSTADTER, sworn and examined.

The CHAIRMAN. I have received your letter, Mr. Hochstadter, and note what you say. Mr. Sadler, as I understood him, did not ask for a reduction of the tariff on these imported goods, but took the position that there should be some law in addition to the copyright law which would protect both the American and the foreign makers of wines and liquors against the use of their bottles and their labels by other people who put up a different article.

Mr. HOCHSTADTER. That is an impossibility. That is what they have been trying to do, and I can easily prove why it is an impossibility.

The CHAIRMAN. You say it is impossible?

Mr. HOCHSTADTER. You refer to a law about the new shapes of bottles, do you not?

The CHAIRMAN. No. Mr. Sadler brought in here a number of labels—20 or more different labels made in imitation of the labels, for example, of the Canadian Club whisky.

Mr. HOCHSTADTER. That is not a matter of pure food. No one need think I am in favor of an imitator. I am trying to aid in securing the use of pure food. It would be impossible to have a different-shaped bottle.

The CHAIRMAN. No such claim has been made before this committee, and if made it would be received as absurd. What do you manufacture, Mr. Hochstadter?

Mr. HOCHSTADTER. Cordials.

The CHAIRMAN. Please name one of your cordials.

Mr. HOCHSTADTER. Maraschino.

The CHAIRMAN. I have a right to make a bottle like yours, have I not? There is no patent on a bottle.

Mr. HOCHSTADTER. That is right.

The CHAIRMAN. Suppose you have gone to the trouble of showing people, by years of upright business dealings, that your Maraschino cordial is a pure cordial, and suppose that I come along and sell to a saloon keeper, or offer for sale, a cordial, and he asks what it is and, I reply that it is "Jacquin's Maraschino;" and suppose that he does not look at it very closely, but that if he did he should see in large letters the name "Jacquin." Would you not consider that a fraud?

Mr. HOCHSTADTER. But we have already all those laws to protect people. They are prosecuting all those imitators. I do not see what this has to do with the pure-food question.

The CHAIRMAN. It has a great deal to do with it, for the reason that we are inquiring with reference to adulterations of food. You grant that liquor is a food?

Mr. HOCHSTADTER. Yes.

The CHAIRMAN. Anything that goes into the stomach is a food?

Mr. HOCHSTADTER. Yes.

The CHAIRMAN. This committee is directed to inquire with reference to all adulterations of food, including cases in which one article is sold for another—sold in fraud to the consumer. I might call for your cordials, and if I pay the price I am entitled to get them; but it would be a fraud if some one should sell me a cordial that I did not want, which he pretends to be the article that I call for. The claim is that the copyright law does not afford protection in all cases. It is not altogether a question of injury caused by the article, because the article is not always bad. For instance, glucose is sometimes sold for honey.

Mr. HOCHSTADTER. Well, that is not what I am arguing. I mean to say that all dealers should be compelled to put their names on the bottle, showing who the manufacturer is. There should be a heavy penalty for the use of any other name than that of the manufacturer. But when it comes to the use of names which have become generic the fact is that the foreigner has the right to those names only until the American has become acquainted with the process of manufacture.

The CHAIRMAN. I see what you mean. Of course there is no disposition to let the foreigner have a monopoly of the name?

Mr. HOCHSTADTER. That is what they are trying to get.

The CHAIRMAN. They can not have a monopoly of a name of an established article. They might just as well say that the name whisky was patented.

Mr. HOCHSTADTER. That is exactly it; that is just what they are after.

The CHAIRMAN. You need have no fear that they will succeed in that.

Mr. HOCHSTADTER. Well, last year we defeated a bill at Washington on the subject. Mr. Israel F. Fischer worked for us on that. They want the right to use the generic name.

In other words, the foreign manufacturer finds that we in this country can make cordials equally good as theirs, and they find out that we are in a condition to sell them cheaper, and so they feel hurt. There is no doubt that the United States Government, by reason of the ability of our own citizens to manufacture cordials better than before, is losing money on the duty compared with what they received ten years ago. But the Government is more than compensated for that loss by the gain in the establishment and maintenance of factories and the variety of industries that have sprung up.

The CHAIRMAN. I agree with you on that. You will not have to argue with me very long on that point—but this in entering somewhat into a discussion of the tariff.

Mr. HOCHSTADTER. There is absolutely no provision made for punishing the foreigner if he sends impure food into the country. The claim has been made that we have no jurisdiction over the foreigner, inasmuch as he is in Europe and if he violates our laws regarding foods there is no way of punishing him.

I do not see why it can not be fixed, by law, so that the agent here who markets the goods can be held responsible if he introduces goods that are not what they ought to be, and that are not labeled for what they are. We have, certainly, jurisdiction over him. He is an American citizen; or at least he does business in our country and must be subject to our laws.

I know that there are more adulterations on the other side than there are here. The Europeans are past masters in the art of adulteration.

I am fully in favor of pure food. I make a specialty of making and selling pure goods and high-priced goods. People say to us, "Your goods are all right, but they are so high priced." But if a man makes his goods by the right process he is obliged to charge so as to cover the cost of his process and afford him a profit. I have found cordials that were made from wood alcohol and with colors that are not healthy. I have found them made with all kinds of ingredients that should not have been used in their manufacture. But that difficulty exists in Europe even more than here. They send us wines which have never seen a grape, and which they could not sell or use in their own country, and are prohibited from using there by law; but there is no prohibition against their exporting them to this country. There is no opposition in Bremen to a man sending port or sherry wine here which would not be tolerated there.

The CHAIRMAN. It is a part of the duty of this committee to recommend a bill to be passed which shall, so far as practicable, forbid the exportation to this country of goods that are prohibited from sale in the countries in which they are manufactured. For instance, in Germany they take what is called "black jack" and send it here by the ton and sell it to our people as coffee. We propose, if we can, to prohibit the importation into this country of every article that is prohibited in the country of manufacture.

Mr. HOCHSTADTER. But how will you know? That is the point I wish to bring up. He is not prohibited over there from sending it here. Say, for instance, cognac. We pay five, six, and seven dollars a gallon for it. I do not say that all cordials or cognacs coming here are not pure. Many of them are, and we have to compete with them. We can easily compete with all articles of pure food, but what we can not compete with is adulterations.

The CHAIRMAN. You ask in this letter the privilege of filing a brief of a statement.

Mr. HOCHSTADTER. A printed brief; yes.

The CHAIRMAN. You can send it to me and I will have it printed in the record in connection with your testimony.

Mr. HOCHSTADTER. I will thank the committee if it will do so.

The brief is as follows:

ARGUMENT OF ISRAEL F. FISCHER BEFORE COMMISSION TO REVISE PATENT AND TRADE-MARK LAWS OF THE UNITED STATES, AGAINST RECOMMENDING AND ADOPTING A STATUTE TO PREVENT USE OF SO-CALLED FALSE INDICATIONS OF ORIGIN, NOVEMBER 19, 1898.

GENTLEMEN OF THE COMMISSION: Representing the Wholesale Liquor Dealers' Association of New York, I appear to oppose the adoption of any statute intended to deprive them of the use of the words "Port," "Madeira," "Burgundy," or similar words, as provided for by Articles I, II, and IV of the agreement concluded at Madrid April 14, 1891.

The proposed legislation is far-reaching and very dangerous to our domestic industries. Note the language: Article I provides for the seizure of "all goods bearing false indication of origin," and Article IV provides that "the tribunals

of each country will decide what appellations, on account of their generic character, do not fall within the provisions of the present arrangement, regional appellations concerning the origin of products of the vine being, however, not comprised in the reserve provided for the present article."

Thus, wine products are specially excepted, and tribunals can not arrange for them any classification, but they must, by themselves, form a separate and distinct class; and the mere passage of an act to ratify the agreement of the convention will result in inflicting great injuries, as I shall endeavor to prove to you later on.

When the American wine grower concluded to go into the industry, his first step was to provide himself with the grape which was used by the European growers and which had made their wines famous, and he accordingly secured the Malaga, Muscatel, Tokay, and other varieties, and having planted them here, succeeded in raising a very superior quality of the various kinds, and out of their growth has been able to make the very finest qualities of the various brands of wine and brandy, and to-day they are so recognized the world over. To these wines it was necessary to give a name, and our growers, looking upon the names always theretofore used as denoting kind, followed in the footsteps of their European competitors, and applied the names to their products of a similar character, as, for instance, Malaga, to wine of the Malaga grape; Port, to wine of dark color, heavy in body, and very rich, made under process similar to same wine made elsewhere; Sauterne, to white, dry wine containing small proportion of acid; Claret, to a light-red table wine, made as all such wines are made the world over, excepting that our products are purer and generally better; Champagne, to all sparkling wines; Cognac, to brandy distilled from the grape and peculiarly treated.

These names were given to these goods because they were necessary to the article, just as much so as cologne (which took its name from the city where it was first made) is looked upon as identifying the article and not making claim of place of manufacture. Instance, also, Brussels carpets, Russia leather, Morocco leather, Swiss cheese, Axminster carpets, Cashmere and Tweed cloths, Dresden and other china ware, Burgundy, Sherry, Muscatel, Tokay, Curaçao, Cognac, French mustard, Dutch metal, German silver, Spanish point lace, English mufins, and French confections.

The American producer claims equal quality, and for many things superiority, to the foreign articles, but our trade would never have reached its present great proportions if they had not used these names.

By enacting the law proposed the manufacturers would be compelled to adopt new names to designate these goods. What names could be used to make known to the consumer the fact that the things advertised and offered for sale are the particular goods heretofore known by the familiar names so many years in use? How could an intending purchaser know what to ask for unless he still persists in calling it by its old familiar title? It will certainly require years to educate our people up to this, while meanwhile our foreign cousin would reap his harvest and our brother at home would be ruined.

The producer does not pretend, nor does the consumer for a moment believe, that these generic names indicate origin. The former merely labels them thus for the purpose of identification of a brand or kind, and the latter buys them fully understanding it. In fact, the only opportunity to misrepresent is held by the foreign manufacturer, who through his agents here is supplying our people with spurious and inferior goods.

It is a fact well known by consumers as well as dealers that but very small portions of sherry, Madeira, port, Burgundy, Cognac, and Tokay are made or shipped from the localities where they were originally made and introduced and from which they derived their names. Vast amounts of imported inferior or imitation sherry are made in and shipped from Hamburg, Bremen, Cetze, etc. The greater portion of our imported ports are made outside of Oporto and are shipped from Cetze, Tarragona, and Hamburg, and the greater portion of our foreign Cognacs come from Bordeaux and points other than Cognac.

Medford rum was originally distilled in the town of that name, but the market is supplied to-day by many distilleries located elsewhere, with the best quality of the article so named, and if the use of the name were to be prohibited, the market would suffer, because the plant situated in Medford is inadequate to supply the demand, and those located elsewhere would suffer great financial loss, to the benefit of no one.

One could go on for hours naming the many articles of domestic manufacture that are covered by these same conditions and show the great pecuniary loss that would result from the adoption of this suggested act, but it does not seem to me

necessary, as it would simply be duplication, and I will therefore only mention a few.

Bourbon whisky was first made in Bourbon County, Ky., but the market is supplied in chief by distilleries located in other parts of the country with what is known as Bourbon whisky, the name being looked upon not to indicate origin, but to distinguish a certain kind of whisky made out of certain ingredients under a certain process.

Selters water, or Selzer water, derives its name from the town in Hesse-Nassau, Germany, where first discovered, and the name has since been applied to all mineral waters, whether natural or manufactured, which contain the same properties. This does not deceive or mislead the public, for they clearly understand the designation.

Russia leather is an article made under a peculiar process and unlike other leather in appearance. It derives its name from the fact that it was first made in Russia, and because of the demand at home our manufacturers went into its production, and, in order that it might be identified and disposed of, attached the original name to it, and it has since held its place in the markets of the world.

Our potters, after many years of trial and the outlay of large sums of money, have succeeded in producing chinaware equal if not superior to many sent from abroad, and in order to compete with their foreign competitors were compelled to and did apply the names by which they were known to the world, to wit: Dresden ware, Belleek ware, carlshad ware, and the like; if they were to be deprived of this right they would suffer irreparable loss and an industry which our Government has done much to foster would be ruined.

Our carpet manufacturers have taken first place with their goods, to which, because of style, they have applied the old familiar names, such as Brussels and Axminster. What will they do if not allowed to continue these names?

Our brewers, in order to properly brand their light and heavy beers, have adopted names such as Pilsener, Culmbacher, Franciskaner, Munchener, Braunschweiger, etc. The consumer very well knows that they are not imported, nor do the brewers pretend that they are; but the passage of this law will compel them to adopt new names and cause great injury.

What names, I again say, shall the American producer adopt for his goods if he may not use those alluded to? What names shall be given to port, sherry, Tokay, Madeira, Burgundy, Cognac, Champagne, Muscatel, Russia leather, French calf-skin, morocco, plaster of paris, Prussian blue, Frankfurter sausage, French soups, Nubian blacking, German silver, Dutch metal, Brussels carpet, Axminster carpet, Swiss cheese, Jamaica rum, French spirits, and Curaçao?

Long usage has given to these names a meaning far different than indication of origin. On the contrary, they are looked upon as designating a particular article thus long described, and not indicating place of production.

We claim that such legislation as this is not only unjust, but unwise and entirely unnecessary. Sufficient law already exists for the protection of both dealer and consumer. Section 8 of chapter 11, United States Revised Statutes, better known as the Dingley bill, requires that a stamp or label in legible English words shall be placed in a conspicuous place on all goods imported, showing the country of its origin. Surely this provides every safeguard against false designation, and the public are fully protected.

We desire to raise an objection to the constitutionality of the proposed enactment. The courts have held that except for the right of the Government to protect the revenue, an act compelling shippers to mark their packages, etc., in a manner to plainly show the kind and contents can not be sustained.

The right to sell such goods within the confines of a State belongs only to that State, and Congress has no jurisdiction. (*Vance v. W. A. Vandercook Co.*, No. 1, 170 U. S. Rep., 438; *Scott v. Donald*, 160 U. S. Rep., 58.)

It is a part of the power of each State to make its own police regulations, and upon the arrival within its jurisdiction of any wines or liquors it has sole control over them as though they had been produced there. (Act of Congress passed August 8, 1890, 26 Stat., 313, c. 728; *in re Rahrer*, 140 U. S. Rep., 545.)

Finally, we desire to object to the consideration of this class of legislation by this commission upon the ground that it does not belong to trade-mark or copyright, but belongs to revenue legislation only.

The Revised Statutes, section 3449, which provides that "whenever any person ships, transports, or removes any spirituous or fermented liquors or wines, under any other than the proper name or brand known to the trade, as designating the kind and quality of the contents of the casks or packages containing the same," he shall forfeit the same and pay a fine, is not a trade-mark regulation, but is for the prevention and detection of fraud on the revenue. (*United States v. 132 packages of liquors*, 76 Fed. R. 364, S. C. 22, C. C. A., 228.)

Thus, while it is held that such legislation does not properly belong to copyright, the court sustained the act solely because it was a measure for the prevention and detection of fraud on the revenue, whereas the legislation contemplated will only grant special protection to private individuals and not affect the revenue whatsoever, for whether Cognac or port have new names or still continue under their old designations, the revenue is not affected in the slightest degree. This being so, all the authorities hold such an act as unconstitutional. (See also Trade-Mark Cases, 100 U.S. Rep., 82.)

STATEMENT OF F. J. CRILLY.

Regarding the foregoing testimony of Mr. Hochstadter, the following letter was afterwards received by the committee:

NEW YORK, December 15, 1899.

Hon. W. E. MASON,
United States Senate, Washington, D. C.

DEAR SIR: While your committee was in session in this city Mr. Sigmund Hochstadter, of 227 Front street, this city, wrote you a letter denying the statement of Mr. George B. Sadler, of Bonfort's Wine and Spirit Circular, that the United States Government was defrauded annually of \$6,000,000 by the fraudulent refilling of imported bottles and the local imitation of foreign labels. While it is hard to make an estimate of this loss, it is generally believed that Mr. Sadler's figures underestimate it. The country is flooded with these imitation goods, which are sold as the imported articles, and the fraud will continue as long as the difference between the custom duty and the internal-revenue tax is as great as it is at present, unless Congress passes some very stringent law governing the case. We all believe in domestic manufactures, provided they are sold as such. It is only when dishonest dealers have labels, bottles, caps, and corks falsely marked with the exact names of foreign manufacturers, also with an alleged country of origin falsely placed on cases and bottles, and sell these counterfeit articles as genuine, that the public are deceived and the revenue defrauded by the difference between \$1.10 per gallon, the internal-revenue tax, and \$1.75 per gallon, the custom duty on the imported article, and in the case of liquors by the difference between \$1.10 per gallon and \$2.25 per gallon.

Very truly yours,

F. J. CRILLY, *President.*

TESTIMONY OF JAMES JACKSON.

JAMES JACKSON, sworn and examined.

The CHAIRMAN. Please state your business.

Mr. JACKSON. I represent the fruit interests—the fruit importers, the fruit growers, and the fruit exporters of the State of New York.

The CHAIRMAN. Is there an association of fruit growers.

Mr. JACKSON. Yes.

The CHAIRMAN. What is the name of the association?

Mr. JACKSON. The Fruit Importers' Union.

The CHAIRMAN. Of New York?

Mr. JACKSON. They act as a main body. They consult as an organization.

The CHAIRMAN. The committee will be glad to hear from you, Mr. Jackson, any facts that will enable us to arrive at an intelligent conclusion regarding the duty committed to us. We are directed to inquire as to all adulterations of food, whether those adulterations are injurious to the public health or are a mere fraud upon the consumer by pretending to be what they are not.

Mr. JACKSON. I presume you have read something of the Ford law.

The CHAIRMAN. That is the law of this State, known as the Ford law?

Mr. JACKSON. Yes.

The CHAIRMAN. Has it become a law?

Mr. JACKSON. Yes. It is now a law, since the 1st of September. It applies to the State of New York.

The CHAIRMAN. What are its provisions, briefly.

Mr. JACKSON. It prohibits anybody giving or selling compounds representing them to be something else. If they give you something supposed to be lemonade, it must be lemonade.

The CHAIRMAN. Would you suggest some national legislation of that kind?

Mr. JACKSON. We are looking to this committee for relief. I expect to head a committee during the coming session of Congress to advocate the putting of the Ford law on the national statute book. We shall be very active in trying to convince you gentlemen that the law would meet a long-felt want throughout the United States.

The CHAIRMAN. I certainly think it would be very wise to have some law, if it can be made uniform and fair, to prohibit men from selling, for instance, a thing called extract of cherry or strawberry when there is no cherry or strawberry in it.

Mr. JACKSON. During the last ninety days I have collected something like 400 samples and have had a great many of them analyzed by the New York School of Pharmacy, and it would astonish you to know what they contain. I have gone along Sixth avenue at night with a number of agents, picking up these things from different cafés, and the result shows something astonishing as to the manner in which the public are abused. Forty-eight arrests have been made for offenses of that character within a short time.

The CHAIRMAN. I wish that within the next week or ten days you would be good enough to send me a copy of what you call the Ford bill and make a written statement of the result of the chemical analyses of these different articles you mention.

Mr. JACKSON. I will do so.

The CHAIRMAN. I will have that embodied in the record as a part of your evidence.

Mr. JACKSON. That will be agreeable to me. I shall also send to Washington all the samples.

The CHAIRMAN. Very well. If you will send them to me as chairman of the committee, I will keep them safely and explain their significance to the other members of the committee.

Mr. JACKSON. Some of them, that I have collected in this very district, contain "knock-out drops."

The CHAIRMAN. What are "knock-out drops?"

Mr. JACKSON. A kind of drink that has chloroform in it, I believe, or something of that nature. What we need for the protection of the people regarding pure food and drink is some Federal law that will be similar to the Ford law and strong enough to protect the interests of honest dealers.

Of course we in the fruit business are materially interested in the subject.

The CHAIRMAN. And you believe that the interests of the honest fruit merchants and of the purchasers of fruit are identical?

Mr. JACKSON. Yes.

The CHAIRMAN. And whatever protects you protects the consumer?

Mr. JACKSON. Yes; we have suffered a great deal during the past few years.

The CHAIRMAN. Yet, you have not suffered nearly as much as the children who have eaten or drank the stuff.

Mr. JACKSON. That is true.

The CHAIRMAN. So that your mission, although a commercial one, has a strong moral side to it.

Mr. JACKSON. Yes, that is true. What we want is a law by which everybody who manufactures sirups shall stamp on the bottle what the bottle contains. We do not want to drive anybody out of business, but we want things to be properly marked. I was indorsed by every responsible man in the drug business throughout the State in aiding the passage of the Ford law, and I hope to have the aid of your committee this next winter before Congress in this direction. In many cases I have found a cheap grade of oil of lemon mixed with tartaric acid. Even in many drug stores from which samples were taken we found some cases of this character. Some of these soda sirups are terrible compounds. They have aniline dyes in them. I have picked up in various places 5 gallons of stuff that was supposed to be pure lemon juice. A box of lemons is worth \$3 in the market, and it would take almost 5 boxes of lemons to make that much lemon juice. If it were really lemon juice, it would not be sold for less than \$20 at a profit. Yet it was sold, or held for sale, for children, at 20 cents for 5 gallons. The man from whom that stuff was bought is a large manufacturer, and he has not bought a lemon or an orange in three years. I have informed many of the people from whom I bought my samples that we were going to enforce the law against them. I told that man that if he continued that practice, we should enforce the law against him, and he has not sold any for some time.

You can imagine the importance of this question to men who have large interests in the fruit business—anywhere from \$10,000 to \$100,000 of capital. They are grievously wronged by these imitators. Toward the remedying of that wrong the Ford law was a beginning.

The CHAIRMAN. It was an entering wedge.

Mr. JACKSON. Yes; I am interested personally, as a citizen, in having pure food sold in the community, and am interested as a business man in seeing that my business is protected.

COMMITTEE ON MANUFACTURES, UNITED STATES SENATE,
Imperial Hotel, New York City, November 20, 1899.

TESTIMONY OF J. A. NORTH.

J. A. NORTH, sworn and examined:

The CHAIRMAN. Please state your occupation.

Mr. NORTH. I am with Bartram Brothers, No. 62 Pearl street, New York City; they are exporters of butter.

The CHAIRMAN. The committee will be glad to hear what you may desire to say on the subject of butter.

Mr. NORTH. I met this morning on 'Change Mr. Cracke, the deputy commissioner of agriculture of the State of New York, and he said that he had seen you, Mr. Chairman, and that he had learned that the boracic-acid people had been before you and presented their case.

So far as boracic acid is concerned, I wish to present the question simply as it is related to the butter industry. Technically or theoretically, I may say I know little about boracic acid, but commercially I understand its relation to the butter industry.

The article butter containing boracic acid is forbidden to be imported into many countries on the continent of Europe and into the South American States, under one penalty—confiscation. It would seem as if an argument regarding boracic acid in butter should stop right there. It would seem as if that were enough. I repeat, confiscation is the fate of any package of such butter entering any country of Europe excepting Great Britain and France. Those are the only two markets open to it. I am speaking now of exports from this country. American butter does not go to the Argentine Republic or Australia.

As applied to butter, men may tell you that boracic acid is a necessity, yet out of the 9,000,000 packages of butter that went into Great Britain last year only 19 per cent had boracic acid, and of that quantity France got 800,000 packages, of which it sent to Australia over half a million packages. Taking France and Australia as the basis, there was but 19 per cent of the butter that went into Great Britain last year that had in it boracic acid, while Denmark put in 2,800,000 packages, or nearly one-third of the total, without one particle of boracic acid. Denmark not only rules the butter market in Great Britain, but is gaining in America from year to year. In South America Denmark is the competitor of all nations. More butter goes to southern climates in tins from Denmark than from any other country, and it is all free from boracic acid, because the laws of those countries decree the confiscation of butter treated with such acids if found inside the territory. In Brazil it never gets past the custom-house.

As to European States, there is no anti-boracic acid law in Germany, except that under which the board of health conducts its operations. In the other countries the administration of their laws on this subject comes under either the agricultural department or the customs department. That leaves France and England free from all antiboracic-acid laws. The other States have national laws.

The CHAIRMAN. Do you mean to say that Germany excludes such butter?

Mr. NORTH. Germany excludes it.

The CHAIRMAN. Germany excludes butter having boracic acid under their general pure-food law, on the ground that it is deleterious to health.

Mr. NORTH. Boracic acid is one of the acids named in the law.

The CHAIRMAN. Then there is a law in force there?

Mr. NORTH. There is a law in force, but its administration does not come under the customs or the State authorities. I wish to separate that from the other countries, because all the others are operating under State laws.

The CHAIRMAN. But they have a law about boracic acid?

Mr. NORTH. Yes; I have to stamp on every bale "guaranteed free from boracic acid."

In 1897, when the exposition was opened at Rio Janeiro, I put up 1,680 pounds of butter in 1-pound tins with one-quarter of 1 per cent of boracic acid. Those were to be exhibited at the National Exposition that was to last for six months. That butter never got through the custom-house.

I wrote to Mr. Conger with regard to the matter, he being then the United States minister in that country, and he replied that we had violated the law. There were three other confiscations of butter, and one of the parties told me that he was not guilty of the charge made against him. I had only then begun the study of boracic acid, and I believed it was as harmless and noninjurious as salt, and I believe so to-day—apart from the commercial reasons affecting its use.

The CHAIRMAN. You believe that physically or chemically it is as harmless as salt, but that for commercial reasons its use ought to be regulated here in order to protect those of our people who wish to export and sell our goods abroad?

Mr. NORTH. That is it exactly. So far as concerns the harmlessness of boracic acid, I have taken a half ounce of it in a glass of water and it has done me no harm whatever.

The question of boracic acid in England has not been settled yet. Arrests are made there all the time because of its use.

The CHAIRMAN. If there is no law on the subject, how can they arrest people for its use?

Mr. NORTH. The law is in the counties. I can not tell you how it comes about that the arrests are made; but if you take the London Grocer, you will find mention made of arrests in certain counties because of the use of boracic acid, while in other counties the users go scot-free.

Dr. O'SULLIVAN. It is not possible to have shire legislation as to pure food in England. The shires in England are parts of an integral whole.

Mr. NORTH. What I state is so, however; that arrests are made in some counties and not in others.

Dr. O'SULLIVAN. I think you must surely be mistaken, so far as the law is concerned. It may be administered more rigorously in one county than in another.

Mr. NORTH. If our commissioner of agriculture were here he might be able to explain it. I will ask Mr. Cracké whether I am not right.

Mr. CRACKÉ (deputy commissioner of agriculture of the State of New York). Yes; but it may be, as the gentleman says, that the difference in the different counties is owing to different methods of administering the law.

One advantage of American butter being absolutely pure is that American butter, if pure, is taken into the English markets all ready to be sold again to go to the Continent, something which can not be done with either French or Australian butter, because those contain boracic acid. That retards the commercial opportunities of those butters in a degree equal to whatever demand may arise outside of France and Great Britain. If American butter is kept free from boracic acid, and it arrives in London, Southampton, or Liverpool, it is there salable to go out of Great Britain to the Continent or any port anywhere where there are antiboracic-acid laws. Those laws would exclude the French or Australian butter, and would restrict sales from Great Britain so that French and Australian butter could not be sent into countries having antiboracic-acid laws.

Mr. NORTH. It is best for our American goods to have an open market all over the globe, something which boracic-acid goods have not.

The CHAIRMAN. The converse of the proposition is true, is it, that if American butter goes to England with boracic acid in it its sale is limited?

Mr. NORTH. Yes, that is the idea. If it goes free from boracic acid it has the markets of the world from Great Britain as it has from New York.

With regard to the effect of boracic acid on the butter, it retards the fermentation of butyric acid, which is the putrefaction fermentation, which is the last of the ferments. Boracic acid accelerates the formation of butyric ether and stearic acid, which are much worse than the acidity which would exist without the boracic acid. Butyric ether is only a fugitive condition in butter. The action of stearic acid is the return of the butter to tallow—its return to nature. Boracic acid accelerates these two putrefactions in the ratio of three to one. In other words, boracic acid accelerates a condition which is many times worse than the condition of acidity which it retards.

It is literally true that boracic acid does not preserve. If it restrains rancidity or butyric acid only to accelerate other acids, then it does not preserve. But it does retard the action of butyric acid, which is rancidity.

The CHAIRMAN. You do not, then, consider it as good a preservative as salt?

Mr. NORTH. I could not answer as to that. I think it is as good in that one regard, but it retards the other actions which are far more detrimental to the goods.

During the past winter I made a few addresses at Albany on this same subject, and in order to convert me, Mr. Harris, of the Preservitas Company, brought to Albany four samples of butter put up by their process, in order to refute my statements—four different kinds of butter from four different foreign markets. Within four weeks he called on me. One of those samples was still sweet, while the others were one mass of butyric ether; decayed. I said to him, "What shall I do with these samples? They are silent evidence that my argument at Albany was right." He said, "Throw them in the ash barrel."

Another point that I desire to present on this question is this: Did you ever have a creamery man, a buttermaker, exporter, or merchant come to you and ask you to favor boracic acid? On the contrary, do they not rise up in an army against it? This movement for boracic acid is for dividends, and dividends only. If butter is to be sent abroad and find an open market it must be without boracic acid, and the opportunities of the butter business ought not to be retarded by having this article in our butter.

The countries that I have mentioned, excepting Great Britain and France, have antiboracic-acid laws. The Danish law went into effect April 1, 1897, and the law of Brazil about thirty or sixty days afterward; I will not say with exactness just how soon.

The CHAIRMAN. But they have a law against it?

Mr. NORTH. Yes.

The CHAIRMAN. That is because public opinion is against its use?

Mr. NORTH. Yes.

The CHAIRMAN. I have never heard of a milkman or dairyman favoring boracic acid, but I will say that large shippers have come before our committee—exporters of meat, for instance—who brought telegrams addressed to them ordering, say, so many hams, "boraxed," meaning treated with boracic acid. Is that not what it means?

Mr. NORTH. Yes; that is right.

The CHAIRMAN. I wish to keep my mind free from prejudice on this as on every question. Now, you have this difficulty: If boracic acid is found in the butter which you export and if you should happen to export that butter to any country except Great Britain and France it would be confiscated.

Mr. NORTH. "Capital punishment" is declared against it, as if it were a crime.

The CHAIRMAN. It hurts your business reputation, and it is always bad for a merchant to have his reputation suffer. But here comes a meat man who shows to our committee a number of orders in which meat was demanded, as they said "boraxed," and so much bacon "boraxed." And Dr. J. Frank Billings, one of the leading physicians of Chicago, who is considered also one of the leading scientific men of his generation, and several other leading men, including chemists, informed the committee that there was nothing in the proper use of boracic acids that was deleterious to health. They said, as you have said, that it was a perfectly proper thing to take into the stomach. But I, not being informed as you have now informed me, with reference to the operation of this material on that article, and as to the chemical effects upon the butter, have supposed that if it was a good preservative for meat it would be good for butter, so I am very glad you have given us the information. Have you any knowledge of what is called "process butter," and do you know how it is made?

Mr. NORTH. Yes.

The CHAIRMAN. Will you please state how it is made?

Mr. NORTH. Yes. There are as many styles of making it as there are factories, but the point is to gather the sweetest product that is made on the farm—that is, dairy butter—put it into a kettle and "render it" at a temperature of 110 to 130 degrees, all depending on how much butter fat there is in the product. The stock is gathered together and the temperature to which it is boiled depends entirely on the season of the year, because butter fat to butter is what wool is to a garment. In June or July the butter fat may run to 84 degrees, while in December it may run only to 61 degrees, because in the winter season the cattle eat only dry stuff. For June, July, or August 82 to 84 degrees is a fair average, while for the winter 60 to 61 degrees would be nearer the figure. As I say, it is rendered at a temperature from 110 to 130, and when the butter fat is ready it is precipitated.

There are many ways of precipitating it. Cold water is passed over it for instance, and the oily matter being the lighter comes to the surface. As the oil comes up it catches and brings up all extra particles of animal fiber. You must remember that butter is composed of 5 or 6 per cent of curds. In that way they get a neutral oil. Then they let it "settle." What I mean is, that if poured out at once it would be a mass of little bodies like white sand, there being no contact between the particles, but by letting it settle in a very cold temperature it will come to be like putty. And the secret of the reason why one is better than another is in the temperatures. It is then churned into butter and cream. The oil that goes into that is neutral or better than neutral; there will be a little flavor to it.

The difference in the value of butter to-day, to the extent of about 10 per cent a pound, depends on flavor, yet the flavor is butyric ether and is a fugitive condition. It goes out of some butters in a few days and out of others in a few weeks. The butyric ether is churned

out of the milk and cream into the butter and that constitutes the flavor. It is then packed and marketed in different ways.

A tub of "process butter" made to-day and marketed to-morrow has a flavor that is entirely free from the mass; it was added to the oil; it was not a component part of the mass, and in consequence it goes away in the air. You buy butter to-day and it has this flavor; to-morrow it is gone. Some makers make it so that it lasts a week; others so that it will last only until to-morrow. That is all there is of it.

The CHAIRMAN. You think that they do not use anything but the milk and cream?

Mr. NORTH. They would be foolish to use anything else—there is no necessity for it. The man who gets the best value in the case of "process butter" is he who buys it to-day and eats it to-morrow.

The CHAIRMAN. They appear to pick up some lots of butter of different grades and colors and boil it and wash it?

Mr. NORTH. Yes.

The CHAIRMAN. They take out the impurities in that way and then churn it again?

Mr. NORTH. Yes. What I know of it is not from contact, but I have been watching it.

The CHAIRMAN. That would not be good butter to export, would it?

Mr. NORTH. No; the flavor would go.

Mr. CRACKÉ, The law of this State requires that such butter shall be labeled in large letters, "Renovated butter."

Mr. NORTH. There can be no doubt that this question of boracic acid is a giant. If the practice be persisted in of putting it in butter it will greatly retard our commercial opportunities. Many markets have changed from boracic acid markets to antiboracic acid markets. Yet you see these people advertising that their goods are put up "for English and other markets."

TESTIMONY OF PROF. WILLIAM FREAR.

Prof. WILLIAM FREAR, sworn and examined:

The CHAIRMAN. What is your profession?

Professor FREAR. I am an agricultural chemist.

The CHAIRMAN. Where is your residence?

Professor FREAR. I live at State College, Pa.

The CHAIRMAN. What position do you hold?

Professor FREAR. I hold practically three positions, although they are in reality one. I am professor of agricultural chemistry in the State College of Pennsylvania; I am the vice-director and chemist of the State agricultural experiment station, and chemist to the State department of agriculture.

The CHAIRMAN. Will you be good enough to state briefly the experience and training you have had in your profession?

Professor FREAR. I was educated as a chemist, studying especially at Harvard University, and after some brief experience in teaching general chemistry, I served for two years under Dr. Wiley as assistant chemist in the Department of Agriculture at Washington, leaving that position to accept that which I now hold.

The CHAIRMAN. You have been informed of the general scope of this investigation?

Professor FREAR. Somewhat indefinitely; yes.

The CHAIRMAN. We are expected to report to the Congress upon the necessity of pure-food legislation. First, as to articles of food that are deleterious to the public health, and next as to articles of food that are sold in fraud of the consumer. Have you, in the course of your investigations, come across any food that you considered deleterious to the public health?

Professor FREAR. I have found very little that could be distinctly asserted to be injurious to health in the quantities in which the materials are commonly used, unless it be from the cumulative effects that might result from the continuous use of such materials. From such cumulative effects positive injury might result, particularly in the case of persons of rather weak digestion. I refer to the use of foreign coloring matters, both mineral and coal tar in their origin.

Most of the impurities which I have found in food result from the desire to produce a cheap substitute for standard articles, for the purpose of entering into competition with an unfair advantage over those standard articles. The consequence has been that the consumer has received what was very frequently an article inferior in value, from a nutritive standpoint, and also that the consumer has been obliged to pay for the article he has purchased a very much higher price than he ought to have paid for that particular article, even granting that it might have some considerable food value, simply because it was sold out of its class, with a misbrand upon it. The further result has been that the man who has been intending to be honest in his business has been forced into competition with the people who have sold inferior articles, and in too many cases has been forced to do as the others did to avoid bankruptcy, the final result of course being a great detriment to the morality and honesty of men in business life.

The CHAIRMAN. You have found in many cases men adulterating their goods who openly admitted that they were doing so, as men have come before this committee, who said that they would like a law to stop the practice?

Professor FREAR. I have found many merchants who bought goods with misleading brands, and who said that they supposed from the price that they were not what they professed to be, and they did not want to inquire too closely, but sold them, as their competitors did, under the misleading brands, feeling that it was a necessity, and yet feeling that they would like to be protected from such necessity.

The CHAIRMAN. Have you, in Pennsylvania, any State laws in regard to adulteration of foods?

Professor FREAR. We have; that is to say, we have a number of special laws, and in addition to that we have a general pure-food law.

The CHAIRMAN. What feature of that law do you consider most valuable in the discharge of your duties?

Professor FREAR. I am not sure that I quite gather the purport of your question.

The CHAIRMAN. What feature do you consider most valuable in stopping the adulterations?

Professor FREAR. That which prohibits the sale; that which defines adulteration to consist not simply of the addition of injurious material or the subtraction of valuable material, but the selling of goods under a false brand; that is, goods which are really substitutes in whole or in part for high-priced materials.

The CHAIRMAN. Then if I were to sell honey or an article marked "honey" in Pennsylvania which had no honey in it but was composed of glucose, could I be punished?

Professor FREAR. Yes, by fine; and in case of repetition of the offense, even by imprisonment.

The CHAIRMAN. How long has that been the law of the State?

Professor FREAR. The year of the enactment of our general pure-food law was 1895.

The CHAIRMAN. Does it require the branding of the different articles on the package, or in what manner?

Professor FREAR. That is left somewhat to the discretion of the State dairy and food commission, but it simply requires that what is branded shall not be false. It does not require in all cases that the ingredient shall be branded. The law purposely avoided that.

The CHAIRMAN. That was for the purpose of not interfering with trade secrets?

Professor FREAR. With legitimate proprietary articles.

The CHAIRMAN. Suppose that I should brand a jar of material as maple sugar or maple sirup and it turned out upon analysis to be 95 per cent glucose?

Professor FREAR. For that you would be liable to punishment under the Pennsylvania law.

The CHAIRMAN. What I have branded as maple sirup, however, may in fact have been composed of maple sirup to the extent of 5 per cent?

Professor FREAR. Yes; but I might say as to that——

The CHAIRMAN. I want to get at the idea of adulteration as contemplated by the law.

Professor FREAR. It follows very largely the English definition.

The CHAIRMAN. That is, the common-law definition?

Professor FREAR. Yes. In this case you substituted 95 per cent of an inferior article without warning to the public. If you had labeled it 95 per cent glucose and 5 per cent maple sugar, you would not be liable to prosecution, but labeling it in the other way you would be.

The CHAIRMAN. Do you have any standard for beer in your State?

Professor FREAR. No; we have not. The law has in very few cases fixed standards of foods, leaving the determination of the quality of the article to the judgment of the expert who examined it.

The CHAIRMAN. What would you recommend as to a national law?

Professor FREAR. I am chairman of the executive committee of the National Pure Food and Drug Congress.

The CHAIRMAN. Yes, I am aware of that.

Professor FREAR. I believe that the proposed law introduced several years ago, known as the Brosius bill, with the slight amendments which it has since undergone, is about as good as we can get in the way of a general bill.

That bill fixes the labor of inspection upon a division of the Department of Agriculture already established, constituting the Secretary of Agriculture the executive officer in charge of the measure and making the several United States district attorneys to be the prosecuting officers in their respective districts, upon information lodged by the Secretary of Agriculture after such examination is made.

The law defines adulteration broadly, and does not attempt to specify what foods are to be considered adulterated; that is, it does not indicate anything specifically by name, but simply rather establishes a broad

fundamental law by which at the same time proprietary secrets that are proper to be maintained are respected.

As to the fixing of standards, the Brosius bill, as I understand it, does not establish any standard. It does require of the Secretary of Agriculture that he shall establish the standard. I understand that various legal minds have differences of opinion as to whether that is a proper provision or not.

The purpose of that provision, however, was to make someone responsible for the securing in the first place of accurate information. The first draft of the bill made it mandatory on the secretary to do that through a specified commission, which commission was to be made up of those who were supposedly experts and impartial judges—the association of official chemists of the United States, certain representatives of the American Society (to be designated by the president of that society for the purpose of introducing technical chemistry), who would introduce standards from the chemical standpoint, five physicians from the services of the Army, Navy, and Medical Hospital; and the further proviso was introduced that no standard should be adopted without full notice to all trade interests concerned, and opportunity for a hearing on their part, in order that there may be no snap judgments and no hasty fixing of standards which would do injustice because of lack of information.

The bill, as I say, originally made it mandatory, but owing to certain objections on the part of members of the House of Representatives and of the Interstate Commerce people it was made permissive and not mandatory.

My belief is that a measure of that general character would be superior to the specific laws dealing with specific articles, because it establishes a principle of action rather than making it necessary to take up special legislation for each new particular articles which may be hereafter introduced into trade.

The CHAIRMAN. This commission or board would be allowed to fix standards as exigencies arose—for instance, take the question of coffee alone. If you buy a dollar's worth of coffee you may get a certain percentage of caffeine.

Professor FREAR. Yes.

The CHAIRMAN. That is the essence of coffee?

Professor FREAR. That is the active, or so-called active, principle.

The CHAIRMAN. You may buy another dollar's worth of coffee from another man, and not get one-half the percentage of caffeine that you did in the case of the first purchase?

Professor FREAR. Yes.

The CHAIRMAN. Now, in the medical class of articles, I understand that there is a fixed standard. For instance, when you say "quinine" you know how much of the active principle of quinine there is in a grain or a gram. If they were to adulterate that, there ought to be some way by which a man would know what he was getting and what he was paying for.

Professor FREAR. It is a great question to-day, whether the chief food or drink value of coffee is dependent wholly or most largely upon this material, caffeine. We know that the physiological properties of tea and coffee are different, yet the principle is the same in both cases. In attempting to frame standards there must be great care exercised not to go into details too much.

The CHAIRMAN. So it is with beer; some of it has 5 per cent of

malt extract, some has more and some less, but there might be a standard fixed above which it should or must go.

Professor FREAR. In order to bear a certain trade name?

The CHAIRMAN. Yes; in order to bear a certain trade name. There has been some talk before this committee, and some complaint, to the effect that some proprietary medicines, in common use—the names of which I have forgotten—sarsaparillas, for instance, and mixtures of that kind, contain a poison if taken in too large quantities. What is this article commonly spoken of that is used as extracts for sarsaparillas?

Professor FREAR. I have not made any effort to examine that class of articles. And so I would not attempt to give specific information.

The CHAIRMAN. In matters of that kind—standard proprietary articles—where they contain substances that in themselves are poisonous in an overdose, would you be in favor of having them marked?

Professor FREAR. I believe that nothing of that kind, in the quantities in which they might be used when applied to the purposes for which they are ordinarily applied, should be allowed to be labeled as innocuous.

The CHAIRMAN. You think that they ought to be marked—that if they contain poison it ought to be so marked?

Professor FREAR. Yes.

The CHAIRMAN. As a warning to people not to take an overdose?

Professor FREAR. Yes. They ought to be warned specifically of what is there, or warned that an overdose should not be taken.

The CHAIRMAN. It has been stated in this room—whether stated for the purpose of being placed on record I do not know—that certain extracts and certain sarsaparillas and cordials and things of that kind, for coughs and colds, contained a large amount of poisonous substances which, if taken under the direction of a physician, might not be dangerous, but which really were dangerous in an overdose and in some cases have been known to cause death, by overdoses, because of there being no marks on the bottles.

Professor FREAR. I have no special knowledge of my own on that subject, at first hands, but my knowledge has come to me from those who have made such examinations, to the effect that there are such things in cough medicines and other proprietary articles—large quantities of narcotic substances.

The CHAIRMAN. Ipecac, for instance.

Professor FREAR. In a large number of proprietary articles.

The subcommittee adjourned until Wednesday, November 22, at 10.30 a. m.

NEW YORK CITY, November 22, 1899.

TESTIMONY OF ANTONIO ZUCCA.

ANTONIO ZUCCA sworn and examined.

The CHAIRMAN. What is your business, Mr. Zucca?

Mr. ZUCCA. I am agent for several large Italian houses; Italian producers. I have the honor of being president of the Italian Chamber of Commerce of New York, and I suppose it is for that reason that I am subpoenaed here.

The CHAIRMAN. I have a communication with regard to olive oil, in which your name is mentioned as that of a gentleman who can give us some information on that subject. The committee will be glad to hear anything that you desire to present with regard to olive oil and its adulterations.

Mr. ZUCCA. A few years ago, when Senator Faulkner, of West Virginia, presented what is known as the pure-food bill in the Senate of the United States, the Italian Chamber of Commerce of the city of New York took a great deal of interest in the matter. The object of that chamber is to develop and advance business relations between the United States and Italy, and to see that the products coming to this country from Italy are not adulterated in this country. Such adulterations would, of course, be a detriment to the trade of importers who are doing a legitimate business.

There have been some adulterations in wines brought from Italy, but that is done rather upon a small scale; hardly large enough to do any great harm.

The olive-oil business, however, is very much affected by adulterations. Since the American people have been traveling so much and have got into the habit of using pure olive oil, the article has been much adulterated, especially in the markets of New York, Chicago, and New Orleans.

Olive oil is one of the most healthy condiments, probably equal to butter; and the reason that it is adulterated in this country is that it does not pay to send cotton-seed oil to the other side and pay 50 per cent duty to get it back here. So the people who adulterate this oil import olive oil from Europe and adulterate it here in New York.

Professor Rossati, for the Italian Chamber of Commerce, examined several brands here and found some containing as much as 97 per cent of vegetable oil, lard oil, and oils other than pure olive oil. Of course, that is a great wrong, not only to the consumer but to those who import the genuine olive oil. People in New York adulterate the Italian oil and place on it the same brand as it would have if it came from Europe, with sometimes perhaps the least possible difference, such as one letter more or one letter less in the spelling of the name of the maker, so as to protect themselves from criminal prosecution. They imitate, here, almost all the brands of good, respectable houses on the other side, with, as I say, only some very slight difference, and of course, they sell the product for pure olive oil.

The Italian Chamber of Commerce in New York does not object to the sale of the other oils if they are sold under their proper names. If people wish to drink cotton-seed oil they have a right to do so, but it should be known what sort of oil it is, and the importers ought not to be misrepresented. Such oil should not be marked or labeled as from Lucca, when it is only cotton-seed oil or linseed oil.

We think therefore that there ought to be a law which would make it a punishable offense for people to mark cotton-seed oil with a label reading "olive oil." In this State of New York we have a butter and oleomargarine law which makes it an offense to sell oleomargarine for butter. The quantity of oil sold lately in the United States is very large, and therefore we think it would not be anything but proper for the honest dealer to be protected by the passage of a proper law.

The CHAIRMAN. A law which would also protect the consumer?

Mr. ZUCCA. Yes.

The CHAIRMAN. Then you would favor a national law which, while

not prohibiting the mixing of cotton-seed oil with olive oil, would require that if those oils are mixed they should be so marked?

Mr. ZUCCA. Yes. There are large concerns interested in cotton-seed oil, as such—trusts—so that every national law and every State law that we have tried to enact has been pigeonholed through the influence of those parties, because they thought it would be a detriment to them not to let the people drink cotton-seed oil. If a man's taste has been cultivated to the point at which he will want pure olive oil he certainly will not want cotton-seed oil; and if he is to get cotton-seed oil, then at least he ought to know it.

The CHAIRMAN. We have had several other witnesses before us on similar questions, but not on the question of olive oil.

Mr. ZUCCA. The Italian Chamber of Commerce can give the committee any quantities of samples and memorandums regarding every brand sold in New York. Some of the samples have been found to contain all the way from 10 to 97 per cent of cotton-seed oil. I think that about two-thirds of the olive oil sold in the United States is mixed oil.

The CHAIRMAN. What is the value of pure olive oil?

Mr. ZUCCA. It can be landed here at wholesale, including duty from the other side, at \$1.55.

The CHAIRMAN. A dollar and fifty-five cents a gallon?

Mr. ZUCCA. Yes; that is, in large quantities.

The CHAIRMAN. And large quantities of cotton-seed oil, how much?

Mr. ZUCCA. The best, 39 cents.

The CHAIRMAN. Per gallon?

Mr. ZUCCA. Yes; it is manifest to me that it would be right for the public and for the honest importers to have such a law as we advocate.

TESTIMONY OF ADOLPHUS BUSCH.

ADOLPHUS BUSCH, sworn and examined.

The CHAIRMAN. Where do you reside?

Mr. BUSCH. In St. Louis, Mo.

The CHAIRMAN. What is your business?

Mr. BUSCH. I am president of the Anheuser-Busch Brewing Association.

The CHAIRMAN. How long have you been engaged in that business, Mr. Busch?

Mr. BUSCH. Since 1866.

The CHAIRMAN. You consider yourself a practical brewer, as well as business manager?

Mr. BUSCH. Yes.

The CHAIRMAN. You give your time now, in connection with the association, to the management of the business generally?

Mr. BUSCH. Yes.

The CHAIRMAN. Do you personally visit and see from day to day the process of brewing?

Mr. BUSCH. Yes; all brewings are made under my directions and orders.

The CHAIRMAN. This committee, under a resolution of the Senate of the United States, is investigating the question as to what food products are manufactured that are deleterious to public health, and what food products are manufactured out of proper articles but sold in a way to deceive the consumer.

Mr. BUSCH. Yes; I understand so.

The CHAIRMAN. I desire to ask you, as I have asked other gentlemen, some general questions. I do not wish to inquire into any of your trade secrets or your private business.

Mr. BUSCH. I have no secrets.

The CHAIRMAN. Will you be good enough to tell the committee what you make your beer of?

Mr. BUSCH. The beer of the Anheuser-Busch Brewing Association is made absolutely of barley malt, hops, yeast, and water.

[NOTE.—Toward the close of his testimony Mr. Busch stated that in the manufacture of some very pale beers of the Bohemian type, some rice is used by his company, not for the purpose of cheapening the beer, inasmuch as rice is more expensive than barley malt, but in order to produce a fine, pale, vinous beer of the Bohemian type.]

The CHAIRMAN. Do you use any corn?

Mr. BUSCH. Never. Corn is an article that does not make a high grade of beer.

The CHAIRMAN. There have been gentlemen here who testified before the committee that when they use other cereals besides barley malt—for instance, corn—it is used in an unmalted state.

Mr. BUSCH. Yes.

The CHAIRMAN. You understand that to be the custom?

Mr. BUSCH. Yes; it is a raw product.

The CHAIRMAN. Will you give to the committee the benefit of your experience as to the difference in a general way between using this "raw product" and a malted product? In other words, it is not corn malt?

Mr. BUSCH. No; it is unmalted.

The CHAIRMAN. And it is used as a substitute for barley malt?

Mr. BUSCH. Yes.

The CHAIRMAN. Why do you call it "raw?"

Mr. BUSCH. Because it does not go through the malting process. It is the original corn as it is grown, only the outside shell is taken off. Corn contains starch, exactly like barley, wheat, and oats, but a different kind of starch, though it all leads to the same result. In mixing it up with malt, the starch of a raw product is dissolved and transformed into sugar. Corn contains a certain amount of oily substances, and those oily substances are transformed partly into fusil oil after the fermentation, but the quantity of oil is not so large as to make the quality of beer injurious to health, according to my view. But just this oily matter is the reason why I state that corn added to barley malt does not make a high grade of beer.

The CHAIRMAN. The question whether or not it would be deleterious to health would depend largely on the amount consumed; that is, you do not consider fusil oil a particularly healthy article?

Mr. BUSCH. No; I do not consider it particularly healthy, but the quantity is not so large as to be a very important factor. It is a factor, but not of great magnitude.

The CHAIRMAN. Do you use any antiseptics in the Anheuser-Busch brewings?

Mr. BUSCH. Never.

The CHAIRMAN. Do you use boracic acid or salicylic acid?

Mr. BUSCH. Never.

The CHAIRMAN. In none of your breweries?

Mr. BUSCH. In none.

The CHAIRMAN. And no corn?

Mr. BUSCH. No corn; never have used it.

The CHAIRMAN. How do you preserve your beer?

Mr. BUSCH. Beer is preserved by age. If beer has the proper age in the cellar before being turned out for consumption, it needs no preserving article of any kind or nature. What spoils the beer is the yeast which may still be in the beer when it is handed over to the trade for consumption, but if beer "lagers" sufficiently, say from three to four months, more or less, all yeast that is contained therein settles and the beer is pure of yeast, and therefore needs no preservatives when sold to the trade.

The CHAIRMAN. By the term "lagers"—when you say that if the beer "lagers" sufficiently—you mean if the beer is stored sufficiently long?

Mr. BUSCH. Yes.

The CHAIRMAN. Lager beer, then, means simply stored beer?

Mr. BUSCH. Yes. Good beer should have a lager of at least, as a minimum, three months—from three to six months.

The CHAIRMAN. You mean to say, then, that you store your beer for three months?

Mr. BUSCH. Yes; no beer leaves the Anheuser-Busch Brewery that is not at least three months old. I am always speaking now of fine grades of beer. We do not brew any other.

The CHAIRMAN. Suppose you bottle it; do you use the pasteurizing process?

Mr. BUSCH. Beer that is bottled has to be five months' old if it has to go over the line—to Australia and the tropics.

The CHAIRMAN. There is more danger of fomentation or fermentation in bottled beer than there is in the other?

Mr. BUSCH. No; on the contrary, there is more danger in draft beer than in bottled beer—more danger of a second fermentation.

The CHAIRMAN. The second fermentation takes place when some of these little particles of yeast develop?

Mr. BUSCH. Yes.

The CHAIRMAN. And they are likely to develop?

Mr. BUSCH. Yes.

The CHAIRMAN. And the longer it is stored the more they develop?

Mr. BUSCH. Yes; the more they settle and develop from the beer. They settle right in the bottom of the cask.

The CHAIRMAN. And in letting it out there is always some danger?

Mr. BUSCH. No; we tap the cask so high that there is no danger of flow of the yeast settlement. The yeast which settles settles down very hard.

The CHAIRMAN. In your bottled beer do you use any acids of any kind?

Mr. BUSCH. Never.

The CHAIRMAN. And never have done so?

Mr. BUSCH. Never have.

The CHAIRMAN. Do you use preservatives of any kind?

Mr. BUSCH. Never; and never have done so.

The CHAIRMAN. Do you use any glucose?

Mr. BUSCH. No, sir.

The CHAIRMAN. Do you use any coloring matter?

Mr. BUSCH. No, sir.

The CHAIRMAN. How is the color of the beer fixed?

Mr. BUSCH. That is the product of malt which is dried under differences of temperature. In the case of pale beer the malt is prepared on a lower temperature. In the case of dark beer the malt is prepared at a higher temperature. They differ about 20 degrees—running from 45 degrees to 65 degrees. With 65 degrees of heat there is a higher heat than in the other case.

The CHAIRMAN. It is somewhat like the browning of coffee?

Mr. BUSCH. It is the same exactly. You can have a pale coffee or you can have a very dark one. It is a sort of roasting system.

The CHAIRMAN. By 65 degrees do you mean 65 degrees Fahrenheit?

Mr. BUSCH. No; 65 degrees of Réaumur.

The CHAIRMAN. Speaking still of this high-class beer, the coloring is fixed by the conditions of the malt?

Mr. BUSCH. Yes.

The CHAIRMAN. And the coloring of the malt is effected by the greater or less degree of heat?

Mr. BUSCH. Yes. It is a very poor brewer who uses coloring matter. Or rather, I may say he is no brewer at all.

The CHAIRMAN. In the case of your bottled beer, which you export, have you adopted a system of pasteurizing?

Mr. BUSCH. Yes.

The CHAIRMAN. What is that system?

Mr. BUSCH. It consists of heating the beer in the bottle. After it is bottled and wired, the beer is put under a heating process in a tub filled with water, and that water is brought to a temperature of say, 50 degrees Réaumur. By this hot bath which the beer receives any germs of yeast that may yet remain in the beer, which are not visible naturally, will be destroyed, and the beer will keep in any climate for a long time.

The CHAIRMAN. Take the case of Germany, generally, I would like to ascertain whether there is a uniform law in regard to beer in that country.

Mr. BUSCH. No, sir.

The CHAIRMAN. In some States of Germany they have one rule, and in some others another rule.

Mr. BUSCH. Yes; in some States they allow a raw product to enter into the manufacture of beer and in some they do not. For instance, they permit the use of rice in water to make a pale, fine, vinous beer of the Bohemian style. They use that in Bohemia. In Bavaria they use nothing but malt, hops, water, and yeast. In Prussia they use rice also to a certain degree.

The CHAIRMAN. To make beer with rice is more expensive than with malt?

Mr. BUSCH. It is the most expensive of all. Rice beer is the highest-priced beer made, but the quantity of rice used in those beers is very limited. It is hardly 10 per cent.

The CHAIRMAN. Do they in Germany have a standard of beer—a test?

Mr. BUSCH. No.

The CHAIRMAN. Do they have one in Bavaria?

Mr. BUSCH. No; there is no standard of beer. The beer is only to be made of barley malt, hops, and yeast; that is all the standard there is about it.

The CHAIRMAN. But they can make it as rich or otherwise as they please?

Mr. BUSCH. Yes; you can make it a cheap beer by making it thin, using a common article of malt and hops, or you can make it a fine beer by using the very finest malt and very finest hops.

The CHAIRMAN. In the case of Bavaria, I understand that the Government collects its revenue on the amount of barley that goes into the brew?

Mr. BUSCH. They collect the revenue on the amount of malt that enters into the brewing process.

The CHAIRMAN. But they do not limit the amount of beer that you can make out of that malt?

Mr. BUSCH. No.

The CHAIRMAN. You may make one bottle or twelve?

Mr. BUSCH. No; they have a standard average that they get out of a certain amount of malt.

The CHAIRMAN. That is a business custom, rather than a law?

Mr. BUSCH. It is a business custom, yes. The revenue is so much per hundred pounds of malt.

The CHAIRMAN. After that you can make as much beer as you please out of it?

Mr. BUSCH. Yes.

The CHAIRMAN. And you can sell water for beer if you want to do so—that is, there is no law to prevent you?

Mr. BUSCH. No. So far as I recollect there is no law.

The CHAIRMAN. As to this pasteurizing process, do you use that in all bottled beers?

Mr. BUSCH. Not in all; only in beers which we export—say either to California or Southern points, or those which we export to foreign countries—China, Australia, the East Indies, South America, etc.

The CHAIRMAN. And you state as a brewer and a practical man that this process of pasteurizing alone, without the aid of any preservative, preserves your beer wherever you send it, all over the world?

Mr. BUSCH. Yes, sir; and we have got the reputation in all parts of the world of making the finest bottled beer; the most perfect; and we preserve it by that process.

The CHAIRMAN. And you have no complaint of fermentation for lack of preservatives?

Mr. BUSCH. No, sir.

The CHAIRMAN. Do you think that there ought to be a law to forbid preservatives in beer?

Mr. BUSCH. If the committee finds that there are any preservatives used that are injurious to health, I would favor such a law.

The CHAIRMAN. Not only is it clear that we shall find such to be the fact, but the brewers have testified that they use preservatives, although physicians say that the preservative is in such small quantities that it would not be deleterious to health unless people took too much of it.

Mr. BUSCH. I am pretty much of the same opinion. If you make a law, you ought to make a law for the minimum standard of beer, giving to those brewers who want to make the very best beer, a chance of maintaining competition. Prescribe a minimum standard, and let the competition have its method of making a finer beer in the best way.

they can, and maintain the life of competition. If you should make a law which should say that we should all have to make a uniform beer, where would the good brewer come in? He might just as well close up. There would be no pleasure in the business any longer.

The CHAIRMAN. You make in your brewery different kinds of beer?

Mr. BUSCH. Yes, we American brewers are showing to the Europeans that we can make as good beers as any in the world. I claim that we make a better beer than any in Europe; and in Europe they agree to that. They do not agree to it here, but they do on the other side.

The CHAIRMAN. How many different kinds do you make?

Mr. BUSCH. We make eight different kinds; pale, medium, dark, strong, light, a strong-hop beer, and a less-hop beer—just according to the desire of the trade and their wishes to meet the palates of everybody.

The CHAIRMAN (showing paper to witness). Here is what is supposed to be a chemical combination of standard beers, beginning with lager and running along to export and bock beer and ale, porter, and condensed beer. It is supposed to be a standard, fixed as to what would be a fair beer each in its class, by Professor Rupp, of Germany, who studied these matters carefully. I understand he is a Government chemist and has charge of the Government station at Karlsruhe. Please glance over that memorandum and give us your opinion of it. We do not expect you to give an accurate analysis as to the different ingredients, but state generally your opinion of those percentages, with reference to their constituting a standard beer.

Mr. BUSCH. (Examining the paper). Is this a German opinion?

The CHAIRMAN. You see that what is known as lager beer there contains a certain amount of malt extract to a certain amount of alcohol?

Mr. BUSCH. Is that an official document from abroad?

The CHAIRMAN. No; I do not present it as such. It is handed to me by a friend here, who says that that is what he understands to be the standard fixed. I only wish to know if it is in the neighborhood of what you would consider a fair standard for these different kinds of beers. Of course there must be great leeway.

Mr. BUSCH. Yes; certainly there must. I believe that the standard ought to be established exactly by the quality of material that is used. For instance, say corn; it makes a standard beer—corn and barley malt mixed. Pure malt-and-hop beer makes what you may call an "export" beer, if you want to put different grades on it, and then go on and say what percentage you ought to have.

The CHAIRMAN. Yes; the minimum percentage.

Mr. BUSCH. The minimum percentage.

The CHAIRMAN. And then go on and give an opportunity for the better man to make a better beer?

Mr. BUSCH. Yes.

The CHAIRMAN. But you would favor, as I understand it, a law that would state a minimum, say, of malt extract and other materials going into beer?

Mr. BUSCH. If it is shown that articles are put into beer that are injurious to health, I would favor the passage of a law to protect the public, but if the examination does not show any such thing there

would be no need. You have laws enough for everything already, I suppose.

The CHAIRMAN. But a good brewer can brew to any standard, can he not?

Mr. BUSCH. Oh, certainly.

The CHAIRMAN. And if the law were to say, "Here is the minimum," not stopping to fix a maximum, but saying, "Here is a minimum, to which all must reach," that would not affect any good brewer in this country?

Mr. BUSCH. No.

The CHAIRMAN. It would affect all equally.

Mr. BUSCH. No law would affect a good brewer.

The CHAIRMAN. Except that it might possibly compel his competitor to protect the public?

Mr. BUSCH. Yes.

The CHAIRMAN. As in the case of a flour bill that we passed last year.

Mr. BUSCH. Corn might be mixed with flour, certainly. That was a case of adulteration, but one not injurious to health; and the product was not very bad, either.

The CHAIRMAN. No, but it was not what it was sold for,

Mr. BUSCH. No. Some bakers pronounced it better than the wheat flour. But still it was wrong.

The CHAIRMAN. It is a business fraud.

Mr. BUSCH. It is a business fraud.

The CHAIRMAN. Since that bill was passed I am happy to say that a great increase has taken place in our exports of flour. It became known everywhere that our Government had taken charge of the matter of a standard of flour. They have captured over 10,000 barrels that was mixed. That which contained white corn was not perhaps so bad, but it was the starch that came from the glucose factories, from which the gluten and all life-giving substances had been taken, that made the article so inferior.

Mr. BUSCH. Yes.

The CHAIRMAN. Have you any suggestion that you desire to make to the committee? Speaking for myself, as one member of the committee, I will say that beer is a very important product, not only to the manufacturers, but to the consumers; and if you have any suggestion, in addition to what you have already given, as to the enactment of a law on the subject, I should be very glad if you would give the committee the benefit of it.

Mr. BUSCH. I believe I have explained the situation pretty fully, and I do not think that I have any special suggestions to make.

The CHAIRMAN. The main point, I understand, then in your evidence is that there is no need of preservatives for beer?

Mr. BUSCH. No need; absolutely not.

The CHAIRMAN. And that malt, hops, and water make the best beer?

Mr. BUSCH. Yes; make the finest beer and the finest beer only.

The CHAIRMAN. And that a minimum standard of beer would not be oppressive against the honest brewer?

Mr. BUSCH. No; not at all.

The CHAIRMAN. And that such a standard would do no harm to the man who intends to give a fair article of beer and would be a benefit to the consumer?

Mr. BUSCH. Yes.

The CHAIRMAN. So that the consumer gets what he asks for?

Mr. BUSCH. Yes; the main thing is that the articles that should enter into the brews should be mentioned. I am not opposed to corn; only I say that corn does not make a high grade of beer. I am not opposed to it at all.

The CHAIRMAN. You never have taken any evidence or heard any evidence as to the healthfulness of brewing a raw material—an unmalted cereal?

Mr. BUSCH. No; I do not think there can be any good evidence against it.

The CHAIRMAN. I have a letter here from the Commissioner of Agriculture of the State of New York, which I have recently received, dated the 16th of November, in which he takes the position that there should be a standard for beer, and that the use of unmalted material is bad.

Mr. BUSCH. Is bad?

The CHAIRMAN. Yes. He says it does not ripen. He says: "We can not stop drinking, but we can provide that the commodity offered for sale shall carry as little harm as possible. I understand that the American beer drinker of five years' standing is in a worse position than the German beer drinker of a lifetime," by reason, he states, of the adulterations.

Mr. BUSCH. Who is that?

The CHAIRMAN. That is the commissioner of agriculture of the State of New York.

Mr. BUSCH. Permit me to say, with all due respect, that the commissioner is not posted. I say that the American drinker of twenty years is in a better condition, if he drinks fine beers, than the German beer drinker of five years. But he must select what he drinks. If he is only intelligent enough to drink a good beer, that is the fact. It is the same thing in Germany. There are good and bad beers in Germany. The American intelligent beer drinker is as healthy as the beer drinker in any country in the world.

The CHAIRMAN. That may be so. The statement of the commissioner of agriculture refers only to those who drink adulterated beers.

Mr. BUSCH. Well, the people ought to patronize the honest manufacturer. There is where they make a mistake.

The CHAIRMAN. Did you say that in your brewery you use any rice?

Mr. BUSCH. I do not know whether I spoke of that. We use some rice in our very pale beers.

The CHAIRMAN. I think you said that.

Mr. BUSCH. We use rice in some kinds of very pale beers of the Bohemian type. I should like that statement to appear where I say that we use malt, hops, and water only, if I did not make the qualification.

The CHAIRMAN. Rice is a more expensive product?

Mr. BUSCH. Exactly; the most expensive of all.

The CHAIRMAN. Much more expensive than barley malt?

Mr. BUSCH. Oh, doubly so.

The CHAIRMAN. Then it is not used in order to cheapen the beer?

Mr. BUSCH. Oh, no; it makes a fine pale beer—of a vinous character, of the Bohemian type.

LETTER OF THE COMMISSIONER OF AGRICULTURE, STATE OF NEW YORK.

The following is the letter of the commissioner of agriculture of the State of New York, referred to above:

STATE OF NEW YORK,
DEPARTMENT OF AGRICULTURE,
Albany, N. Y., November 16, 1899.

MY DEAR SIR: I have just noted in one of the papers the following statement made by you:

" Senator Mason, in speaking of the committee's work, said:

" Our investigations up to date have disclosed a remarkable state of affairs. The United States is the only civilized country in the world which does not set a certain standard on its food products. By setting a high standard, as European nations do, we would not only protect the honest producer and consumer, but also increase our exports, for people have faith in our Government; and if they know that the food is inspected and there is plainly marked on each article exactly what it is composed of, they are more ready to purchase it.

" We are also attacking adulterated food that is deleterious to health, and I think that when we hand in our report next month Congress will legislate on the matter, so that the present condition of affairs will be remedied."

Permit me to congratulate you, Mr. Chairman, on the position you have taken as to the question of standards for food, and more particularly as to drinks. It is believed by a goodly portion of citizens of this State that there should be a standard for beer, so that a person buying it to drink could feel sure he was not taking anything injurious into the system. Of course I am not setting myself up as a judge in the matter, but am only speaking of the opinion that prevails. This is based to considerable extent upon the fact that twenty years ago there were a number of malt houses in this State that were doing a flourishing business; that to-day they are closed up with boards over their windows, and the land that was raising barley, from which malt was made, is now producing other crops to be placed upon an already glutted market, which is another reason why farming does not pay. In addition to this fact the acreage of hops now is much less than it was fifteen or twenty years ago, with an increased population and a greatly increased consumption of beer.

It would be hard to make people not financially interested in the production of beer believe that all this change was brought about in the interest of the consuming public or in the interest of health.

The fact that a person who represents the brewing interests appears before your committee and states that the beer brewed after the English manner was just as good and wholesome as that made of hops or malt and cheaper will carry no conviction with it, in my judgment, except the conviction that it is cheaper. This is one of the questions that needs careful attention, because the commodity goes into the human stomach to make for weal or woe. We can not stop people drinking, but we can provide that the commodity exposed for sale shall carry as little danger as possible. I am informed and believe that the

American beer drinker of five years' standing is in a much worse condition than the German beer drinker of a lifetime.

Very respectfully yours,

C. A. WIETING,
Commissioner of Agriculture.

Hon. Wm. E. MASON,
New York City.

The subcommittee adjourned to reconvene at Washington, D. C., upon the call of the chairman.

TESTIMONY OF JOHN F. HOBBS.

JOHN F. HOBBS, sworn and examined:

The CHAIRMAN. Please state your occupation, Mr. Hobbs.

Mr. HOBBS. I am editor of the National Provisioner. Dr. Senner, late Commissioner of Immigration, is the proprietor of the paper.

The CHAIRMAN. Where is the paper published?

Mr. HOBBS. The publication offices are 150 Nassau street, New York City, and the Rialto Building, Chicago.

The CHAIRMAN. Your name was given to me as that of a gentleman who takes great interest in the matters pending before the Committee on Manufactures, and if so we should be glad to have a statement from you with reference to those matters.

Mr. HOBBS. I may say that I ought perhaps to apologize for not appearing before the committee voluntarily, but it was because we did not wish to be in the position of throwing evidence at the committee.

We are always ready to assist the Government with reference to any matters affecting pure food. We have assisted the Department of Agriculture in many ways, and we are certainly in favor of some measure that will protect the public and the honest manufacturer with reference to matters affecting the purity of the food and drink of the people. And in correspondence with others I find that there is a very general feeling throughout the trade for a strong national measure which will protect both the manufacturer and the eater. If a man goes to buy an article, he wishes to get what he is buying, and when a man desires to sell an article he should sell it on its merits; and no trade tricksters ought to be permitted to come in and take his market from him with something that is "just as good."

Some time ago Professor Duff, who is himself a practical chemist, and whom we secured after he had had fifteen years' experience with packing houses in the West, conducted, through our laboratory department, a large number of experiments on foods. As foods came out we made a habit of analyzing them. I told Mr. Wilson, Secretary of Agriculture at Washington, that we would give him any data in our possession; and I am sure that Dr. Duff will be glad to give it to this committee.

In our correspondence and investigations among the packing-house trade we find a general complaint against spurious food articles. They put up things which they call by improper names, and put them out in the trade for the things whose names they bear, sometimes without specifying any firm name. There is a disposition on the part of some tradespeople to remove the labels, and not only that, but to remove

even the product from the package and place it in a similar package and relabel it. I will instance what I mean by a reference to the manufacture and sale of oleomargarine. I have received personally compounds, and have visited one place where a duplicate package or bucket is held; the outside is heated and the butter product is bodily lifted out and put into this other package, and then it is relabeled "creamery butter." That is not right.

The CHAIRMAN. No; that is a violation of the present United States law.

Mr. HOBBS. And of the law of the State of New York also.

The CHAIRMAN. Yes.

Mr. HOBBS. In our analyses we find that the legitimate butter compounds are healthy in themselves; that is, they are free from deleterious substances; they are made of animal and vegetable fats—some of them, the best quality of them—and are sold as such. But a man who goes into a store to pay, and pays, 25 cents a pound for butter does not expect to buy an 18-cent product. And the packers themselves have complained to me that they are under ban on account of this.

You could obtain further evidence on these matters from chemists. But I may say, in brief, that there is a general opinion throughout the trade that a good national law should be passed. We are not against a law which shall state that the can shall contain what the label states that it contains as nearly as possible. Then we know what is inside.

Reverting to the question of olive oil, as to which a gentleman testified before your committee, I have bought olive oil in Marseilles and found on the package the word "Cincinnati." It was sold to me as pure Italian olive oil. I told the man from whom I purchased it that it was an American oil. "Why," he said, "olives grow wild in Cincinnati." He thought Cincinnati was an Italian port.

The CHAIRMAN. This occurred, you say, in Marseilles, France?

Mr. HOBBS. Yes. It seemed to me very strange to find an olive oil in Marseilles labeled "Cincinnati" and considered to be an Italian product.

Because of the investigations in our own laboratory we are, as a paper, in favor of a strong national pure-food law—a law that would provide a correct standard; that will insist on certain chemical purities, and give proper designations on the packages, so that the buyer can see a correct description of what he is buying. We desire this not only for the integrity of our home trade and in behalf of our honest manufacturers, but for the integrity of our trade abroad, and in order to do justice to the honest importers and the honest foreign manufacturers.

Speaking from the point of view of the editorial department, I wish to say that I will be glad to file with your committee later on any data which you may wish to look over and append to your report. I do not know that there is anything else that I desire to say unless you wish to ask me some special questions.

The CHAIRMAN. I believe there is nothing special that I wish to ask. I thank you for your willingness to give us the data to which you refer, and also for your opinion regarding a proposed national law. I will ask your chemist a few questions.

TESTIMONY OF JAMES C. DUFF.

JAMES C. DUFF, sworn and examined:

The CHAIRMAN. Will you please state your business or profession, Mr. Duff?

Mr. DUFF. I am an analytical chemist and the official chemist of the New York Produce Exchange. My practical profession may be termed that of packing-house expert.

The CHAIRMAN. Have you taken a course of studies to prepare yourself for your profession?

Mr. DUFF. I am a graduate of the Massachusetts Institute of Technology.

The CHAIRMAN. Your studies in that institution included, of course, analytical chemistry?

Mr. DUFF. Yes.

The CHAIRMAN. How much experience have you had in analyzing—how many years have you been at the work since your graduation?

Mr. DUFF. About fifteen years.

The CHAIRMAN. Do you find any adulterations in the food products of the country that you have had occasion to examine?

Mr. DUFF. The food is largely adulterated.

The CHAIRMAN. Name some of the adulterations.

Mr. DUFF. Well, during the course of an investigation which I was asked to undertake last summer, I found that, practically, you might say, there are adulterations in all grades of foods, although I do not for a moment claim that all food is adulterated. You can buy pure coffee and you can buy coffee that is adulterated. Pepper is perhaps one of the most largely adulterated things in the market; you can seldom get it pure. I found in pepper such things as cracker meal and ground corn and other refuse. I found that mustard was largely exhausted, if I may use that term; very few, if any, samples that came under my observation containing the maximum amount of oil of mustard that should be there. The great adulterants are starch and flour, colored up with turmeric. In the matter of condensed milk I came across a sample in which it was hard to find any fat whatever. Naturally condensed milk should contain a large amount of fat, but it was largely sophisticated. There are good brands, but there are very many brands that ought to be prohibited from being put on sale, and those are sold—as I purchased mine—for 2 cents a can. That is simply criminal, to my mind, for the reason that it was only the poorer class of people that got them. To feed such material to a hungry child would be to starve it to death. Such adulterations should be denounced as criminal, although, in fact, it might be classed as harmless to health.

The CHAIRMAN. But it is sophistication?

Mr. DUFF. Yes.

The CHAIRMAN. And considering that it is a food for infants and invalids, it is more of a crime than if it were something that well persons would take?

Mr. DUFF. Yes. Butter that I found was renovated. You understand what "renovated butter" is, I suppose?

The CHAIRMAN. I wish you would state to the committee what it is and how butter is renovated.

Mr. DUFF. All classes of butter, irrespective of conditions, are collected and remelted at as low a temperature as it can be handled; it is then sweetened with milk and rechurned, if possible—the rancid acids or free fatty acids are eliminated largely—and worked up into the trade condition that it is ordinarily subjected to, by manipulation, into packages resembling creamery butter.

The CHAIRMAN. The rechurning is simply a washing, really?

Mr. DUFF. Yes.

The CHAIRMAN. That gets the acids out?

Mr. DUFF. Yes; and in order to bring back the natural texture and appearance, as far as possible; but the chief point is to eliminate the rancidity of it or the fatty acids.

The CHAIRMAN. Those that float on top?

Mr. DUFF. No; they are soluble in water. The rancidity is butyric acid and ethers.

The CHAIRMAN. And when the water is taken off, they are taken out?

Mr. DUFF. Yes; and it leaves the grease.

The CHAIRMAN. You would not consider that butter unhealthy?

Mr. DUFF. No; I would not consider it detrimental to health, but it is simply a fraud.

The CHAIRMAN. It is simply what has been butter, plastered and revarnished?

Mr. DUFF. Yes; like many other things it is simply a fraud on the buyers, but it is not detrimental to health.

With regard to soda water, I examined some soda-water sirups in soda that is sold for five cents a glass. For the five cents I had to stop the man from giving me more of the syrup than I wanted. I found that the sweetening base was saccharine and not sugar—saccharine colored up with aniline.

The CHAIRMAN. Colored with an aniline dye?

Mr. DUFF. Yes. Most of these things of which I speak were purchased in very poor localities. I did not find enough of this dye present to be deleterious to health, if only one glass of soda were taken, but I would not say what might not result from the continuous use of such material.

With regard to fruit jellies, it is very difficult indeed to obtain a pure fruit jelly, most of those being subjected to the usual sophistications, glucose being largely the base.

Catsups are largely sophisticated and artificially colored.

Olive oil is, as we all know, very largely adulterated with other edible oils, such as cotton-seed oil and peanut oil, when the price is consistent with their use.

With regard to tea, I came across one very poor sample, although it might have been that the impurity was an accidental impurity in the sample which, with another gentleman, I purchased. It contained many other things than tea; the pods of seeds; there was some hair in it, though that might have been accidental, as I say; the stems constituted the heavy portion of the sample, and the thing itself was almost entirely lacking in theine.

The CHAIRMAN. That is the essence and particular matter of the tea?

Mr. DUFF. Yes. It would give one the impression that it was an exhausted tea; that is to say, tea which had been used once and was

collected and dried again. I would not say that that was the fact, but one would get that inference from the sample.

Those constitute, to a greater or less extent, some of the investigations which I am still pursuing. We of the National Provisioner propose to follow up this line, with the view of assisting the Government in framing a law which will protect the public and further the passing of this law, which certainly is sadly needed.

The goods adulterated were universally the cheap articles. I have not come across what you might term absolutely poisonous adulterations.

The CHAIRMAN. That is, if used in small quantities?

Mr. DUFF. Exactly; if used in the quantities which a single meal would entail.

The CHAIRMAN. And you favor a national law, do you?

Mr. DUFF. Decidedly so.

The CHAIRMAN. What is meant by "facing tea" and what is meant by "weighting it"?

Mr. DUFF. Facing tea is putting a surface on it and giving it, perhaps, a different appearance from what the product would naturally have.

The CHAIRMAN. How is it done?

Mr. DUFF. By treating the tea with a solution, in order to give it an external coating; a solution, or it may be a powder. Ultramarine has been used for facing some teas.

The CHAIRMAN. And with reference to weighting it; how do they make tea heavier?

Mr. DUFF. That would include weighting.

The CHAIRMAN. That is all done in one process?

Mr. DUFF. Yes.

The CHAIRMAN. Do you believe that a great deal of that has been done?

Mr. DUFF. Yes; in the cheaper grade of teas. In coffees it is a delicate thing to draw a line between what is adulteration and not adulteration. The ordinary adulteration law, as drawn by the various States, would preclude the treatment of coffee as it is treated by many manufacturers. That is to say, when the coffee is roasted more or less of the water which, in its original state, it contains is driven off. When coffee is changed from cold to hot much more moisture evaporates. To avoid that, coffee is treated to a solution, a very small quantity of a solution, so that the coffee is coated with a solution, which dries on it, thereby preventing further evaporation and keeping the weight in the coffee.

The CHAIRMAN. As I understand, the roasting process naturally drives out the moisture?

Mr. DUFF. Yes.

The CHAIRMAN. And I understand that they preserve the moisture or drive it back into the coffee by this process you describe?

Mr. DUFF. Yes.

The CHAIRMAN. Have you described the whole process?

Mr. DUFF. I have only spoken of the glazing; it is before the process of roasting.

The CHAIRMAN. But before this glazing is put on is there not some way of preserving the moisture?

Mr. DUFF. There might be. You take 100 pounds of coffee and

roast it, and, assuming for the moment that there would be 15 per cent of moisture in it and that 15 per cent is gone, can you put it back and make the lot weigh 100 pounds again? I doubt it.

The CHAIRMAN. You could put some moisture back.

Mr. DUFF. It does not seem credible to me that a roasted thing can contain as much water as a raw thing.

The CHAIRMAN. Not immediately after roasting, but it might be immediately steamed and the moisture put back again.

Mr. DUFF. Yes; that might be.

The CHAIRMAN. In 100 pounds that would not amount to much, but in a ton it would make a good deal.

Mr. DUFF. Yes. I do not say that it might not be so. I have considerable information as to this investigation that I conducted last summer, and if you wish I will submit you a brief of it.

The CHAIRMAN. I shall be glad to have it.

Mr. DUFF. There are two kinds of mixtures in the market—one, as you might say, legitimate, and the other illegitimate. What I mean by legitimate is such things as butterine and oleomargarine, made from perfectly good material under Government supervision. In those the Government is protected, notwithstanding that they are mixtures, whereas these cheap mixtures are frauds upon the public. If there are any other questions which I can answer I shall be glad to do so.

The CHAIRMAN. There is nothing further that occurs to me.

STATEMENT OF THE CHAIRMAN FOR PUBLICATION.

At the request of the representative of the Associated Press, the chairman made the following statement for publication:

I feel that the committee is well repaid for the work we have been doing in New York, and am pleased to find a strong public sentiment here in favor of the objects of the investigation. I am particularly pleased to note the strong sentiment in favor of national legislation, every witness practically testifying that the laws of States, differing so much, as they might, the differences would prevent uniformity. In other words, New York, a great wholesale center, is interested in having a uniform law for marking its goods, to avoid the danger of one State violating the laws of other States which might require a different brand of their goods.

I am thoroughly convinced that the public sentiment agrees with the position which this committee is taking, that a uniform standard of goods, under a national law, will be such a certificate of the character of our products that it will increase the volume and the market price of our exports.

This principle, I think, has been recognized by the manufacturers and wholesale merchants of New York who have testified here. Even men using and selling adulterated goods have said to the committee that they would gladly quit the practice or would mark the goods for what they are if their competitors were compelled to do likewise.

I think that the work of the committee will lead to such a consensus of public sentiment that we shall have a national law which will accomplish at least four things:

First. To prohibit the importation into this country of articles manufactured abroad the sale of which is prohibited in the countries of manufacture.

Second. To prohibit the importation of refuse articles of food, such as can not be sold in the countries from which sent.

Third. To prohibit the use of deleterious adulterants; and,

Fourth. That when adulterants are used that are simply to cheapen articles, but which result in deceiving the purchaser, the law shall go as far as possible to compel the manufacturer and dealer to mark the package for what it actually is.

The subcommittee adjourned to reconvene at Washington, D. C., upon the call of the chairman.

COMMITTEE ON MANUFACTURES, UNITED STATES SENATE,
Washington, D. C., November 27, 1899.

The subcommittee reconvened at the rooms of the Committee on Manufactures, United States Senate, at 10.30 a. m.

Present: Senators Mason (chairman) and Harris.

TESTIMONY OF EDWARD R. EMERSON.

EDWARD R. EMERSON, sworn and examined:

The CHAIRMAN. Where do you live?

Mr. EMERSON. In Washingtonville, N. Y.

The CHAIRMAN. What is your business?

Mr. EMERSON. I am president of the Brotherhood Wine Company, which is a corporation.

The CHAIRMAN. What do you manufacture?

Mr. EMERSON. We manufacture champagne and still wines of different kinds—port, sherry, and claret.

The CHAIRMAN. Where is your vineyard?

Mr. EMERSON. We have a vineyard at Washingtonville, N. Y., and also a vineyard at Hammondsport, N. Y.

The CHAIRMAN. You manufacture champagne and still wines at both places?

Mr. EMERSON. Yes, sir.

The CHAIRMAN. What is your definition of champagne?

Mr. EMERSON. Champagne is a sparkling wine, made by the French process of fermentation in the bottle, which requires from three to four years to complete.

The CHAIRMAN. Is there anything properly known as or that can be called champagne that does not ferment in the bottle?

Mr. EMERSON. Yes, sir; there is what in the trade we call a bogus champagne, made by taking a still wine and forcing into it carbonic acid, which is produced from sulphuric acid and marble dust generally. That is not considered in the trade to be a true champagne.

The CHAIRMAN. In what particular does the American or domestic champagne differ from the imported or French champagne?

Mr. EMERSON. There is practically no difference. They are made in exactly the same way by the leading companies. We are using the same methods and experience that it has taken them some two hundred years to acquire. We use exactly their methods.

The CHAIRMAN. Do you have to age your wine that length of time here?

Mr. EMERSON. Yes; we never put a bottle of champagne on the market until it has been in bottles at least three years.

The CHAIRMAN. What is the process of manufacture, briefly?

Mr. EMERSON. The process is in the first place to have your grapes absolutely clean, well picked over, and the proper variety of grapes to produce the flavor that you wish in the champagne. Then it is crushed and the juice is put in barrels or casks and allowed to ferment. In the spring this wine is taken and put into a large tank—what we call a bottling tank—holding from two to four thousand gallons. It is then bottled, after the addition of some older wine. Champagne always contains more or less old wine. The perfection of the champagne comes in in the perfection of the wine and in the careful and judicious selection of the grapes to make the original blend before they are pressed, and also in the care and skill that is taken in regard to developing the wine in regard to temperature. Then it is bottled and allowed to remain in a moderately warm place until fermentation commences in the bottle. As the fermentation proceeds the bottles break more or less, and that is the only way that we can tell how the fermentation is proceeding. After it gets to a certain point and the bottles are breaking too fast we move that champagne into a colder apartment, so as not to entirely chill the fermentation, but so as to lessen it and lessen the pressure slightly on the bottle. It is gradually moved from one apartment into another until at the end of perhaps three, four, or six months it arrives at the coldest cellar that we have, which we call our storage cellar. There it lies in tierage, lying on the side, to keep this gas from escaping and also to economize space. It lies there from three to four years in properly made champagne. Then it is taken and put on tables which have holes made through them—plank tables, set in the form of an A, with holes intended to hold the bottles. When it is first put in it is quite flat and a sediment is formed from the fermentation which falls directly to the bottom of the bottle in a little streak. It is shaken every day by a dexterous twist of the wrist and gradually raised up until in the course of some weeks—sometimes two weeks, but sometimes three months, according to the obduracy of the sediment to leave the bottle—it arrives at a vertical position. When the sediment is directly on top of the cork, then we take the champagne from there and take it up to the finishing room, carefully keeping the bottle with the cork down, so as not to disturb the sediment. In the finishing room it is disgorged; that is, the cork is dexterously taken—with drawn—allowing the sediment and a small portion of wine to be removed. The escaping gas is allowed to blow out with the sediment. Then it is put on a finishing table and a small dosage is added to it to slightly sweeten it and render it a little more palatable. That addition is called dosage.

The CHAIRMAN. What is the dosage made of?

Mr. EMERSON. It is made of rock candy and old wine. A very small percentage is used.

The CHAIRMAN. Does not the carbonic acid gas escape?

Mr. EMERSON. Yes; to some extent it does, but the bottles originally contain more of that gas than is needed.

The CHAIRMAN. The investigation that this committee is conducting is intended to include all food products and all drink products—what, if anything, is deleterious, and what, if anything, is sold for what it is

not. Do you, in your opinion, use anything that is deleterious to health?

Mr. EMERSON. Absolutely not.

The CHAIRMAN. You have told everything that you use?

Mr. EMERSON. I have told everything that we use.

The CHAIRMAN. Do you have any competition with adulterated wines? You understand, we do not want to inquire into any trade secrets of yours, nor do we ask you to testify about any private matters of business, but we would like to know if there is any suggestion that you have to make upon these points that I have mentioned.

Mr. EMERSON. The great impediment to the increase in the sale of true domestic champagnes is largely in the prejudice that exists in the public mind against them—against American champagnes. That, perhaps, up to the present time, has militated to a considerable degree against the sale of our genuine, rightly produced champagnes in this country.

The CHAIRMAN. I do not know that this committee could make any recommendations to remove prejudice, but if you have any manufacturing competitor who is not dealing fairly with the public, we would be glad to know that. Do you have to compete with some of these artificial champagne people—this carbonated material, or with any other that is not genuine champagne?

Mr. EMERSON. That, in my opinion, is what has caused the prejudice against the true champagne. The carbonated product being artificial and being produced in ten or fifteen minutes, simply carbonated with artificial gas and made with any kind of wine and labeled so as to tell an untruth—they call that champagne which is not champagne in any sense of the word, and it has turned a great many American wine drinkers against the domestic champagne. People who have been in the habit of drinking wine would try that so-called champagne, and of course they would be disgusted with it, and they would never try it again, but simply make up their minds that all American champagnes were poor products. Every such man becomes an enemy of the true American product.

The CHAIRMAN. What remedy would you suggest for that condition of affairs that this committee or the Senate could have jurisdiction over?

Mr. EMERSON. I would suggest that the producers of such wines or such so-called champagne should be compelled to state on their labels what are the contents of the bottle, whether carbonated champagne or genuine champagne, although there is no carbonated "champagne" really.

The CHAIRMAN. In other words, if it is a genuine champagne you would like it to be marked so.

Mr. EMERSON. Yes.

The CHAIRMAN. If it is made by generating its own carbonic-acid gas you want that fact stated.

Mr. EMERSON. Yes.

The CHAIRMAN. But if it is simply injected into new wine you want that fact to be shown on the label.

Mr. EMERSON. Yes. I claim that it is a deception on the people, and those who sell the product should call it what it really is.

The CHAIRMAN. Have you ever seen this process of making champagne out of new wine, or what they call champagne?

Mr. EMERSON. Yes.

The CHAIRMAN. How do they do that?

Mr. EMERSON. That is done exactly the same as they would charge mineral water or soda water. The wine is first put into bottles and then it is put into a machine connected with retorts containing gas. A little faucet is then turned, allowing gas to run into the bottle containing the wine, and perhaps it takes two or three seconds and then the bottle is taken quickly from the machine and corked. Then it is finished and labeled up and sold as genuine champagne.

The CHAIRMAN. What is this gas; how is it produced?

Mr. EMERSON. It is largely produced, I think, and in fact almost entirely, from sulphuric acid and marble dust—sulphuric acid put on marble dust.

Senator HARRIS. And carbonic acid gas is evolved, of course?

Mr. EMERSON. Yes. Then they claim to purify their gas and wash it more or less, but even then it is not champagne.

Senator HARRIS. Is there any distinction in your mind between genuine champagne and the wine that is charged with carbonic-acid gas artificially, so far as health is concerned—or, in other words, between a wine charged by carbonic-acid gas and a wine charged by the processes of nature?

Mr. EMERSON. There is a marked difference. In one case the wine contains carbonic-acid gas naturally. Carbonic-acid gas is an inherent part of the true champagne. In the other case it is artificial gas forced into the wine. The wine will take up a certain amount of this gas, and the gas being made from acid, the wine containing it produces a different result, especially after allowing it to stand for a short time.

Senator HARRIS. You think there is a distinction of an absolute character between the carbonic-acid gas produced by the fermentation of the wine itself and the carbonic-acid gas produced in any other way?

Mr. EMERSON. Yes, sir; I think there is.

Senator HARRIS. So far as health is concerned?

Mr. EMERSON. I think there is, sir. A carbonic-acid gas produced by the fermentation of grape juice, which contains all the elements to make the carbonic-acid gas which the wine holds in it, is a natural carbonic-acid gas, and it contains no impurities.

Senator HARRIS. Well, carbonic-acid gas has a distinct formula. It makes no difference, does it, how that is produced, if you reach the point of pure carbonic-acid gas?

Mr. EMERSON. Well, if it is absolutely pure I should say not, but we claim that they can not get a carbonic-acid gas absolutely pure.

Senator HARRIS. You think there is more or less of sulphuric acid or sulphurous-acid gas, perhaps, contained in it?

Mr. EMERSON. Yes; and the character of the gas itself is different because the character of the ingredients is different.

Senator HARRIS. But we can produce the same thing from a variety of articles.

Mr. EMERSON. Well, for instance, in a carbonated glass of wine and a natural glass of wine there are different processes. In a natural glass of wine there is a natural gas when it is poured out, and you will notice that in the case of a carbonated glass of wine it sparkles for a few minutes and is then dead, showing that the gas has been forced into it and is soon lost. In the case of a natural glass of wine, it will bubble for

two hours. There is also a great difference in the sides of the bottle in the two cases.

Senator HARRIS. What evidence have you as to the relative healthfulness of the two classes of wine?

Mr. EMERSON. Well, I am not a chemist, and I do not know that I am competent to offer an opinion.

Senator HARRIS. The object of this committee is, primarily, to protect the health of the people.

Mr. EMERSON. Yes, sir.

Senator HARRIS. That is the essential point of this investigation.

Mr. EMERSON. I have never used any artificial wine except to sample it. I have never drank it except in very small quantities.

The CHAIRMAN. The artificial carbonic-acid gas can be put into new wine, but if it is to be natural it has to be made in old wine. In other words, it takes time to generate it in the old wine, does it not?

Mr. EMERSON. Yes, sir.

The CHAIRMAN. And if it is a natural champagne it is bound to be old wine?

Mr. EMERSON. Yes.

Senator MASON. And people understand that they are buying old wine when they champagne?

Mr. EMERSON. When they buy true champagne.

The CHAIRMAN. And, of course, carbonic-acid gas may be injected into fresh, new wine?

Mr. EMERSON. Yes.

Senator MASON. That is, if put in by the artificial process?

Mr. EMERSON. Yes.

The CHAIRMAN. So that at least it is a sophistication and is intended to deceive?

Mr. EMERSON. Yes.

The CHAIRMAN. When it is put in fresh it is intended to deceive?

Mr. EMERSON. Yes.

The CHAIRMAN. If it is an old wine it will make its own gas?

Mr. EMERSON. Yes.

The CHAIRMAN. And in the case of new wine they put it in?

Mr. EMERSON. Yes; they generally choose young wine on account of its cheapness.

Senator HARRIS. In your definition of champagne you spoke of wine that has undergone certain processes.

Mr. EMERSON. Yes.

Senator HARRIS. Would not a proper definition go farther back? Would it not mean grapes of a certain character or grapes grown on a certain soil, primarily—of course, grapes grown in a certain province of France?

Mr. EMERSON. Yes; that was originally the true source or origin of the name champagne—grapes grown in a particular province of France.

Senator HARRIS. A province of a very limited area?

Mr. EMERSON. Yes. Then the producers in that province of the wine called champagne in that district of Champagne got their materials outside of their own district, and still they called their wine or their product champagne, until now the word "champagne" is a wine produced in a certain particular way, just as we speak of a wine pro-

duced in a certain way as port wine, meaning a wine that is produced in the same way as wine was produced in Portugal originally. The term "champagne" now means a wine produced by the French or natural process of fermentation in the bottle. They speak of German champagne and French champagne without any regard to the original Champagne district. In that way we take liberties with the name champagne.

Senator HARRIS. In your idea it is the adherence to the original process of manufacturing that constitutes champagne?

Mr. EMERSON. Yes, sir.

Senator HARRIS. As it was originally practiced in the province of Champagne?

Mr. EMERSON. And as it is practiced now.

Senator HARRIS. Yes. You mentioned certain changes that have occurred, but still it is practically the same process?

Mr. EMERSON. Yes; they got outside wines to assist their own supply, their own supply being short.

Senator HARRIS. Is there any other sophistication or adulteration that you know of used in what are called champagnes?

Mr. EMERSON. No, sir; I do not know that there is. It is practically impossible to adulterate a true champagne. The wine has got to be a true wine or you can not make a champagne of any merit out of it.

Senator HARRIS. That is, even with this injected carbonic-acid gas you still have to have wine?

Mr. EMERSON. Well, I was speaking then of the true champagne. With an artificial method you can use any kind of wine; it does not make any difference whether it contains salicylic acid or other things.

Senator HARRIS. That is, you could make it sparkle for a time?

Mr. EMERSON. You could make it sparkle for a time, whereas in the case of the natural wine if it contained any impurities it would not respond to the process. It would not sparkle. It would remain flat in the bottle. In making a true champagne you would have to have a wine to begin with.

The CHAIRMAN. You would recommend, then, that whether for domestic or imported wine the true champagne should be marked as such and that the other should show that it was carbonated?

Mr. EMERSON. Yes, most decidedly.

The CHAIRMAN. And that, in your opinion, would protect the consumer of the real champagne and would inform the consumer of the other?

Mr. EMERSON. Yes.

The CHAIRMAN. Are you acquainted with French brandies?

Mr. EMERSON. To a limited extent.

The CHAIRMAN. Do you manufacture still wine also?

Mr. EMERSON. Yes.

The CHAIRMAN. I believe you testified to that.

Mr. EMERSON. Yes.

The CHAIRMAN. Have you any suggestions to make as to the proper branding of still wines made in this country or any other country?

Mr. EMERSON. It occurs to me that it would be only fair to apply the same rule to still wine that we suggest to apply to champagne. There is, and has been for a long time, a very large proportion of the

American still-wine production sold under foreign labels, with the clear intent to deceive the public.

The CHAIRMAN. You think that that ought to be corrected?

Mr. EMERSON. I think it would be only fair to the consumer to correct one as well as the other.

The CHAIRMAN. And how about the adulteration of wine—the blending and mixing and making artificial wines? You have seen those, have you not?

Mr. EMERSON. Yes; but I think there is very little of that done in American wines; and I think the compelling of an American wine man to put an American label on his American wine would have a tendency to lessen that, because he would have to put his name on the label, whereas if he puts it up under a French label, if there is anything wrong, any fault found, it is put on the French wine, and he is not responsible for it.

Senator HARRIS. Going back to champagne, is there a large amount of this artificial-process champagne on the market and being sold all the time?

Mr. EMERSON. Yes; a large amount.

The CHAIRMAN. Of domestic and foreign manufacture both?

Mr. EMERSON. Yes; I think both, although I have no experience with the carbonated imported wine, but I understand that that is also sold here in a limited way. A while ago, when the duty was less on champagne, there was more of that cheap character of wine sold here, but under the present tariff we have not had that to compete with so much.

The CHAIRMAN. Have you anything further to suggest for the benefit of the committee?

Mr. EMERSON. I think not. I think I have covered the ground.

The CHAIRMAN. You feel that there ought to be a national law to compel people practically to show by their labels or to say by their labels what is in the bottle?

Mr. EMERSON. I think so. I think that would be to the ultimate great advantage of the American wine industry.

The CHAIRMAN. And it would be also a benefit to the man who buys a thing, who ought to be permitted to get what he pays for?

Mr. EMERSON. I think it would be a benefit to the producer and the consumer both. The best of the American wines are now sold as foreign wines in our market.

Senator HARRIS. We have certain States, however, having pure-food laws which require the accurate labeling of things of that sort.

Mr. EMERSON. Yes.

Senator HARRIS. Do you know anything as to the pure-food law of the State of Michigan?

Mr. EMERSON. I am not posted about that.

Senator HARRIS. Do you know what sort of market those goods have that you speak of—American goods sold as foreign in this market?

Mr. EMERSON. No; I do not. We put our own label upon every bottle of wine that we sell, so we do not get into conflict with that at all.

Senator HARRIS. But do you know of the other kinds of wine that come in conflict with it? I thought that perhaps you might have seen that in certain States they were barred out by the State law.

Mr. EMERSON. I do not know; it would be very difficult to prove that wines shipped from another State into ours had been fraudulently labeled.

Senator HARRIS. It would have to be determined by chemical analysis, I suppose?

Mr. EMERSON. No analysis would show. They would have to get at the derivation of the wine—at the kind of grape it was made from. An analysis might show that it was a pure wine.

Senator HARRIS. But you say that a natural wine effervesces for a very much longer time than the other.

Mr. EMERSON. Yes; but I was speaking of the still wine.

Senator HARRIS. But I am speaking of the competition with the carbonated champagne.

Mr. EMERSON. I did not know of any State that had a law which was put in force against carbonated champagne.

Senator HARRIS. I do not know whether the Michigan law reaches it or not, but that law requires the formula in the case of almost everything to be given if it departs from the true thing.

Mr. EMERSON. Well, I do not think it is complied with or enforced in regard to carbonated wines. I had reference to American goods under foreign labels in giving my previous answer relating to still wines. A pure-food State law does not cover the point outside of its own State.

Senator HARRIS. Certainly not.

Mr. EMERSON. And it does not restrict shipping into that State of almost any kind of goods.

Senator HARRIS. But it prohibits their sale, which practically prohibits their shipping in.

Mr. EMERSON. But it is very much evaded, inasmuch as the original shipper is not responsible. A national law covering that point would cover everything and be efficacious.

Senator HARRIS. Well, I do not know as to that.

The CHAIRMAN. It would be uniform, at any rate, and cover all States alike.

Senator HARRIS. The requirements would be uniform, but the question of enforcement is a matter of official action.

The CHAIRMAN. It might be enforced in one neighborhood and not in another.

TESTIMONY OF WALTER E. HILDRETH.

WALTER E. HILDRETH, sworn and examined:

The CHAIRMAN. What is your residence?

Mr. HILDRETH. New York City.

The CHAIRMAN. What is your business?

Mr. HILDRETH. I am president of the Urbana Wine Company.

The CHAIRMAN. What kind of wines do you make?

Mr. HILDRETH. Champagnes and still wines; some brandies, but very little.

The CHAIRMAN. You have heard the evidence of the last witness in regard to what he considers a champagne?

Mr. HILDRETH. Yes.

The CHAIRMAN. Is that your definition of champagne as it is now understood in the trade?

Mr. HILDRETH. As I understand the word champagne, it is a term used for a certain wine, made in a certain way. It has become an accepted term for wine which is fermented in the bottle, which produces carbonic-acid gas and has a sparkling effect when poured out.

The CHAIRMAN. In manufacturing your wine do you use anything but grapes?

Mr. HILDRETH. No, sir; but of course in the finishing we add a finishing sirup to the wine, but the sparkling quality of the wine is due entirely to the fermentation of the grape juice in the bottles.

The CHAIRMAN. Do you or not use any artificial carbonic-acid gas?

Mr. HILDRETH. No, sir; none whatever. The wine is, in the first place, the result of a process which the old French covered by the term "the marriage of the wine." It is a new and an old wine blended together. The wine made in the fall is blended with the old wine in winter and allowed to remain a certain length of time, after which it is bottled and corked. The wine is then left in the cellars for a period of two to three years or more, during which time it goes through what they call the second fermentation. During that second fermentation carbonic-acid gas is produced, the same as any wine will ferment. In fermenting it will produce carbonic-acid gas, but with a cork in the bottle the gas is all retained in the wine. In producing that gas it forms a sediment, which drops to the bottom or side of the bottle as the bottle is laid in racks in the cellar. When they get ready to finish the wine it is put in "horses" or tables. The neck of the bottle is put into that thing and is kept nearly flat at first and lies there from ten days to two weeks, after which time the bottles are handled with a certain quick knack, and each time it is picked up it is tilted a little more, bringing the sediment down by degrees to the cork. Sometimes the sediment is stuck to the side of the bottle and they have to do what they call "pounding" it until they get the sediment removed and get it down to the cork. When it is finally down to the cork it is ready to be what they call "finished." That takes from two to four months.

When ready to be finished it is taken up to the finishing room. The wine is then, as they say, "disgorged," and a finishing sirup is added to the wine, consisting of old wine and a small percentage of white cognac brandy and rock candy. In the American champagne we use simply these three ingredients. We depend entirely, for the flavor of wine, on the blending of the three grades that we use. In the French champagne the wine itself has little or no flavor, and they add to the original liqueurs or cordials, which is the secret of the flavor of the French champagne. We depend entirely on the flavor of the grape which enters into its composition. That is really the only difference between the French and the American true champagnes.

After that when the wine is disgorged it is passed quickly to a dosing machine, where the pressure is equalized and the sirup allowed to flow in, and it is then corked and allowed to be put out for use. We keep it for from three to six months, allowing the sirup to blend with the wine.

Senator HARRIS. Can champagne be made from the juice of any grape?

MR. HILDRETH. Almost any grape—the black grape as well as the white grape. In fact, the best champagne grapes that we have are the black grapes.

SENATOR HARRIS. It is in the process then, more than in the natural juice of the grape, that the champagne function or quality lies?

MR. HILDRETH. It depends entirely on the process; but some grades will ferment and produce the gas better than other grades will. There are certain classes of grapes that produce a good champagne, while others will not do so. From what I know of the business I am satisfied that the California grapes as a general rule do not produce as good a champagne as the Eastern grapes—the same as certain districts where they produce heavy wine they do not produce the same quality of champagne as grapes produced in other districts. Some grapes produce gas better than others.

SENATOR HARRIS. Aside from the question of flavor, you think?

MR. HILDRETH. Yes.

SENATOR HARRIS. Of course the bouquet would differ?

MR. HILDRETH. It would differ with the different grapes used.

THE CHAIRMAN. Have you any suggestions to make to the committee as to adulterations? You do not adulterate any goods?

MR. HILDRETH. No, sir.

THE CHAIRMAN. You do not use anybody's labels but your own?

MR. HILDRETH. No; we make brands of wine for two or three different people, but they are labeled for those people and labeled as American wines. They are special brands made by us for those particular people, but they have their names on them.

SENATOR HARRIS. They bear their names as manufacturers?

MR. HILDRETH. Yes; made for them as a special brand.

THE CHAIRMAN. If I had a run on a certain brand of wine called the A B C wine I could send to you year after year and have that brand made?

MR. HILDRETH. Well, not now, sir; we are still doing it for the old people that we have had for a long time, but we do not take any new customers for that particular sort of thing now, because we want to produce our own brand and label. We are working for ourselves and not for them.

THE CHAIRMAN. But when you do make it you brand it for what it is?

MR. HILDRETH. Oh, yes; in other words, we do not make a foreign label for anybody. We do not imitate any foreign or any domestic wines for them.

THE CHAIRMAN. Do you think there ought to be some national legislation to compel all manufacturers, whether foreign or domestic, to mark their goods for what they are?

MR. HILDRETH. I do.

THE CHAIRMAN. And when they are carbonated that fact ought to be shown on the label?

MR. HILDRETH. Yes; the question of carbonated wines is a serious one for us in this country. We make wine of the same character as is made in Champagne, France. We do not say that it is made in Champagne or in France, but we put on it our own label, and we claim that it is a true champagne, inasmuch as it is made by the same process as the French champagnes are made. Of course we do not want to come into competition with a wine which can be made in fifteen

minutes and which has none of the properties of the true champagne. And it seems to me that those quickly made champagnes ought to be labeled for what they really are.

The CHAIRMAN. That would protect you and the consumer as well?

Mr. HILDRETH. Yes. We are perfectly willing to put on our label the fact that our wines are made in the United States. In fact, we do put that on our wines ourselves, and we put on also the name of the place where the wine is made, and we would like to see everybody else do the same thing. It is a protection to the public as well as to ourselves.

Senator HARRIS. Is there a large amount of this artificial-process champagne on the market?

Mr. HILDRETH. How much I could not say, but we run across it all the time and in every direction.

Senator HARRIS. There is a good deal of it?

Mr. HILDRETH. Yes.

Senator HARRIS. You have no idea as to the percentage at all, or could you give us an approximation as to the percentage of that kind of wine that is sold as champagne?

Mr. HILDRETH. No, I could not. We run across a good deal of it and there is a good deal of prejudice against American champagnes due to that class of wines. There is no question about that.

Senator HARRIS. That is aside from the preference for wines made in France?

Mr. HILDRETH. Yes, entirely aside from that. We very often run across illustrations of this prejudice in this way: We speak to people in regard to the American wines and they say: "Oh, I have tasted such and such a wine; it is a miserable sort of stuff; I would not touch it again." We attempt to tell those people that our wines are different from the wines that they say they have been drinking and against which they have formed this opinion. But they say: "Your wines are American champagne?" We say: "Yes." Then they say: "Well, this was American champagne, and I do not want to have anything to do with it." They have got from their grocer something in the way of an article called American champagne for which they have paid, perhaps, a quarter of a dollar per half pint. They have taken that home and tried it and have been disgusted with it, and when anyone wants them to taste American champagne, they say: "Oh, well, we have tasted that sort of thing, and we don't want to have anything more to do with it." They will not be talked out of that prejudice derived in that way.

The CHAIRMAN. Could you produce and sell at retail, at that price, a bottle of that wine if it was a genuine article?

Mr. HILDRETH. We could not, of course; it would be impossible.

Besides being a wine producer, I am the proprietor of the West End Hotel, at Long Branch, and I want to give an illustration of this prejudice that we meet against American wines. A certain judge was living at my hotel for a number of years at Long Branch, and claimed to be quite a connoisseur in the matter of wines. I had been trying for a number of years to get him to test our Urbana wine. He said to me: "I have tested and tasted American wines, and I do not want to have anything more to do with them." One day, about three years ago, Mr. Peters, of the firm of Smith & Peters, who are the agents of the Cliequot champagne, was down there and invited

a number of friends to take some of his champagne. He was about to introduce his new Brut wine and invited a number of his friends, as I say, and I had the honor of being among those whom he invited to take a bottle of this new wine. After having tasted it, the question of the dryness of the wine came up. I suggested that we should try a bottle of our Brut—the "Gold Seal" Brut. Just as the bottle was opened this judge came into the barroom. Our label for this Brut is a yellow label, the color being the same as the Clicquot yellow label. At the same time our label is entirely different. It is labeled, very distinctly, "Gold Seal Brut," with the Urbana Wine Company's name on the label. But the color is about the same color as that of the Clicquot yellow label. The judge came up to the bar and said: "Mr. Peters, am I in this?" And Mr. Peters said: "Certainly." The judge noticed the peculiar color of the label, and he was very fond of the Clicquot wine, especially the Yellow Label, as he had frequently drank it. He put the glass to his nose and smelt it. He tasted it, and he said to Mr. Peters: "They may talk as they please about those new wines, but," said he, "your old Yellow Label is the best wine that comes into this country." He says: "That is the most delicious glass of wine that I have ever tasted." I said to him: "Judge, did you look at that label before you tasted the wine?" He said: "No, but I know the label very well." He then looked at the label, and was dumbfounded to find that it was our wine and an American wine. That is a case in point that I wished to give to the committee to illustrate the depth and strength of this prejudice and how unnecessary it is. I had tried to get that gentleman for three or four years to test our wines, but he would not think of it.

The CHAIRMAN. I had the same impression that he had, namely, that American wines generally were carbonated.

Mr. HILDRETH. He certainly had an impression that these wines made in this country were all carbonated wines.

Senator HARRIS. Did he have a good opinion of that wine after reading the label?

Mr. HILDRETH. He drank it afterwards, I know.

Senator HARRIS. Of course, in a delicate thing like the flavor of wine, the power of the imagination can not be overlooked.

Mr. HILDRETH. There is no question about that, but the power of the imagination is stretched too far when a man tries to make some of his carbonated wine appear to be the genuine article.

The CHAIRMAN. Have you any suggestion to make to the committee regarding the subject-matter which they are investigating?

Mr. HILDRETH. I would suggest, if I were asked about it, that it would be an excellent idea to label wines for what they are. We are perfectly willing to put on our bottles the words "Fermented in the bottle." I have heard some carbonated wine people say that their carbonic acid gas that they put into the wine is perfectly pure, and I have even heard some of them go so far as to say that their wines are better, purer, than the natural fermented wine. Now that may be a matter of opinion. If anybody wants that kind of wine, let them have it, but it ought to be correctly labeled. I think people ought to get what they pay for. We would be perfectly willing to put the correct label on our bottles if they would put the correct label on theirs; and if they would put on "Made in the United States."

Senator HARRIS. Carbonated wines are of both domestic production and foreign importation?

Mr. HILDRETH. So I understand; but there are very few foreign importations now.

Senator HARRIS. They can not afford to pay the duty?

Mr. HILDRETH. No. We have in the State of New York a law governing the purity of wines and things of that kind; but the trouble with local laws is that they show well on the statute book, but there are no means of enforcing them. Sometimes they are enforced in one State and not enforced in another State. If we could get some general law on the statute books of the United States obliging people who manufacture carbonated wines, or who bring wines into this country, or who sell American wines under foreign labels to sell their products for what they actually are, I believe that individual State legislation would very soon follow a national law, and that the States would enact local State laws to correspond.

The CHAIRMAN. To harmonize with the national law?

Mr. HILDRETH. Yes; to harmonize with the national law and to carry it through.

The CHAIRMAN. Have you in New York any law which prohibits the sale of carbonated wines for genuine champagne?

Mr. HILDRETH. I do not think that question was ever brought up before. I am not positive, but I do not think so.

Senator HARRIS. New York has a pure-food law?

Mr. HILDRETH. I believe so.

Senator HARRIS. Which is enforced through the State board of health or some board of that kind?

Mr. HILDRETH. Very poorly.

Senator HARRIS. But in theory?

Mr. HILDRETH. I so understand, in theory; but there is but very little money, I understand, appropriated for that purpose.

Senator HARRIS. You have never appealed to the State board of health, or to whoever has charge of the enforcement of this law, have you?

Mr. HILDRETH. We have not as yet.

The CHAIRMAN. As I understand, there is no law in New York prohibiting the carbonating of anything and calling it champagne. I have a copy of the law.

Mr. HILDRETH. I believe that you are right.

The CHAIRMAN. That is my recollection.

Senator HARRIS. If they have a law which prohibits the sale of a thing for that which it is not, would not that cover it?

The CHAIRMAN. Possibly it might. (To the witness.) But of course your customers are not all in New York?

Mr. HILDRETH. We have customers all over the country.

TESTIMONY OF DE WITT BAUDER.

DE WITT BAUDER, sworn and examined:

The CHAIRMAN. Where is your residence?

Mr. BAUDER. At Hammondsport, N. Y.

The CHAIRMAN. Are you connected with the same company with which the last witness is connected?

Mr. BAUDER. No, sir; I am manager of the Pleasant Valley Wine Company.

The CHAIRMAN. What is the business of that company?

Mr. BAUDER. To manufacture champagne and still wines.

The CHAIRMAN. In any of your manufacturing processes do you use anything but grapes?

Mr. BAUDER. No, sir.

The CHAIRMAN. Do you use any preservatives—salicylic acid, or anything of that kind?

Mr. BAUDER. Not at all; nor any coloring matter.

The CHAIRMAN. Do you agree with the last witness as to what real champagne is?

Mr. BAUDER. I do.

The CHAIRMAN. It is a wine carbonated by its own gas?

Mr. BAUDER. Yes.

The CHAIRMAN. And developed in process of time?

Mr. BAUDER. Yes.

The CHAIRMAN. An artificial champagne is one carbonated by artificial means?

Mr. BAUDER. Yes.

The CHAIRMAN. The gas being manufactured by some process outside.

Mr. BAUDER. Yes.

The CHAIRMAN. Do you mark your goods for what they are?

Mr. BAUDER. Yes, sir.

The CHAIRMAN. Do you put on them your name and the place at which you manufacture them?

Mr. BAUDER. Yes, sir.

The CHAIRMAN. What do you say, as a manager of a wine company, as to the question before this committee whether there should be a national law to compel the branding or marking of wines for what they are?

Mr. BAUDER. I am heartily in favor of that kind.

The CHAIRMAN. Do you feel that the carbonating of new wines is a detriment to the legitimate manufacture of the true champagne?

Mr. BAUDER. I do, in the way spoken of, that many people, as you yourself explained a little while ago, supposed that all champagnes were made by the artificial process—all that were made in America or in the United States. A man that buys that wine gets a very bad impression of American wine, and it takes a great deal of persuasion to persuade him out of that impression.

The CHAIRMAN. Do people get that impression from the taste or the effect of it?

Mr. BAUDER. Both.

The CHAIRMAN. Artificial carbonating, you think, has a different effect from the natural carbonating.

Mr. BAUDER. Well, I will say that I went into a place in New York some years ago with a friend of mine. The party in the place knew nothing about who I was, and he showed us through his place, and finally offered us a glass of wine, what he called champagne. I took a small glass of it, and I had not got a block off before I left it. My friend soon left his also. I had been in the business for some twenty-two or twenty-three years at that time, and I had had nothing of that kind before.

Senator HARRIS. Have you any other evidence at all as to the hurtfulness of this wine?

Mr. BAUDER. No; only this: We have taken some little pains to

keep a tab on this wine, and in the case of a few bottles that we bought for experiment we found at the end of some two or three months that it produced a sediment which a genuine champagne will not do. I mean that there must be some chemical action in that wine other than the natural action, because it would not deposit a sediment otherwise.

The CHAIRMAN. In champagne you wait for months and years until that sediment is deposited and then take it out?

Mr. BAUDER. Yes.

The CHAIRMAN. Before final corking?

Mr. BAUDER. Certainly.

The CHAIRMAN. But, of course, if they carbonate new wine and make champagne in a few days, that would leave the ingredient necessary to make that sediment, would it not?

Mr. BAUDER. A genuine champagne made by fermenting in the bottle must of necessity be a perfectly pure wine. We have occasionally some little accident, and we find that something has gotten into the wine in the process of champagnizing it or of fermenting it in the bottle. The thing will magnify like a magnifying glass, and will come out and be very strong. You can see why, because the bottle is hermetically sealed, and, although fermentation is going on in the bottle, nothing can escape. We are obliged many times to dock a great many thousand bottles, because it has a flavor that is objectionable. We can not always explain why, but that is the fact.

The CHAIRMAN. I understood you to say that you would recommend, or would be glad to have this committee recommend, to Congress a law that would compel bottlers of goods to mark their goods for what they are.

Mr. BAUDER. Yes; just for what they are.

The CHAIRMAN. And if they are carbonated that they should say so on the bottle?

Mr. BAUDER. Yes; I would be perfectly willing to put on our bottles the words, "Fermented in the bottle."

The CHAIRMAN. All true champagne is so fermented, is it not?

Mr. BAUDER. Yes.

The CHAIRMAN. It would be an advertisement to a person enlightened upon the subject, would it not?

Mr. BAUDER. Certainly. If any man is satisfied with the carbonized wine and buys it for what it is, namely, a carbonized wine, I have no objection. They certainly have a right to manufacture it, but they have no right to manufacture and sell it for something that deceives the people.

The CHAIRMAN. It injures the trade of a man who is making straight goods?

Mr. BAUDER. Yes. I picked up a paper the other day and meant to bring it before this committee, but it slipped my mind, in which there was a very fine advertisement from different carbonators throughout the country, one of them stating that they made carbonized wines. They all state that they are American champagne, and that they are equal to the best imported champagne. Now, a man not knowing anything about champagne might be easily taken in by a sign or advertisement like that, and when he took his wine home he would be much disappointed in it. He certainly would be disappointed if he had a very fine taste. We have in our State a law—the State of New York—which may be called the pure-wine law. I drew the law myself

and had it presented by our member of the legislature, and it was passed, and with the exception of two or three instances it has been a dead letter. It resulted in closing up a house or two in New York that were manufacturing bogus still wine; but in this law it expressly states that no wine shall receive artificial treatment—among other things, carbonic acid gas—and it was a question for a time whether we should try to interfere and ourselves enforce the law, but we finally concluded that it would simply drive the fellows over into New Jersey and that that would end it.

Senator HARRIS. This law prohibits the manufacture, does it not, and also prohibits the sale?

Mr. BAUDER. No; it does not prohibit the sale, but it imposes a very heavy fine and confiscation.

Senator HARRIS. Well, that is practically a prohibition of the sale.

Mr. BAUDER. Well, yes.

Senator HARRIS. So that you could protect yourselves against "Jersey lightning" as well as others?

Mr. BAUDER. I understand; but when it comes to the point how are you going to tell? Suppose it had a new name, you would have no evidence whatever to show how it was made.

Senator HARRIS. You would have to proceed exactly as you would in the enforcement of any Federal law—by analysis or tests.

Mr. BAUDER. Analysis would not show it.

Senator HARRIS. Well, tests of some sort.

Mr. BAUDER. We tried for several years during the process of discussion of a bill that was up for several years as to the manufacturing of beer to have the same penalty; or, in other words, to have the same law applied to the pure-wine bill for its enforcement. That is, the officers that were selected by the legislature or created by the legislature to enforce the beer law should also enforce the pure-wine law, but we never have succeeded in getting either.

Senator HARRIS. You say that the difficulty in the enforcement of the State law is owing to the difficulty of detection practically? How would that be improved by the enactment of another law?

Mr. BAUDER. Well, I do not know. I do not wish to say anything about it in that aspect of the case. It is the simple fact that there is no provision of the law for its enforcement excepting by somebody making a complaint. That throws the trouble upon an individual, which he hates to incur.

Senator HARRIS. Can not your State law be so amended as to invest somebody with the authority to make seizures and tests?

Mr. BAUDER. I say we have been trying for some time to get some law passed making it the absolute duty of some officer to enforce that law, but we have not succeeded.

Senator HARRIS. I do not think that the piling up of additional laws is any benefit to anybody.

Mr. BAUDER. I understand that, but a general law passed by the Federal Government might be and, I think, would be of great advantage, especially if it placed the matter in the hands of the revenue service. Then we would have no trouble in enforcing the law, because an officer would be selected by the operation of the law to enforce it, and he would enforce it upon some one simply making complaint to him. He would take it upon himself to investigate.

Senator HARRIS. That could be done now under the State law, could it not?

Mr. BAUDER. I do not think so.

Senator HARRIS. States have boards of health and bodies of that character, and they could make a proper examination and institute the prosecution.

Mr. BAUDER. Well, this law was all right, so far as penalties went, but it lacked the element of its being somebody's duty to enforce it.

Senator HARRIS. A prosecuting officer has to be found in the enforcement of nearly all laws. That is the difficulty.

Mr. BAUDER. That is true. It is usually the aggrieved party that sets the machinery in motion. If a man has his watch stolen, nobody will move in the matter with so much energy as himself.

The CHAIRMAN. I will say to Senator Harris that all the witnesses who testified regarding beer have said that they oppose the enactment of State laws because of the lack of uniformity, but they were willing to have a standard for beer (because the standard could be uniform) if enacted by the United States Government. They said that if laws were passed by New York State it might make restrictions on the manufacture of beer and upon beer producers, and that they could not protect themselves against, perhaps, New Jersey and Pennsylvania.

Senator HARRIS. But it seems to me we must remember that we have a dual form of government, and that while it presents some very serious difficulties sometimes in "cutting across lots," as it were, in order to arrive at results, yet it has to be regarded.

Mr. BAUDER. Only a very small part of our business is done in the State of New York. But men who felt aggrieved might take hold and show up those people in New York. They might manufacture wine in New Jersey and Pennsylvania, but not sell any of it in New York State.

Senator HARRIS. This is a police matter, practically, and the States are invested with full police power. The General Government might very generally take hold of many of these police regulations in the State of New York and enforce them much better than your State government would, but people would hesitate very much before giving their adhesion to such a system of interference.

Mr. BAUDER. Well, Senator, I must beg leave to differ with you in relation to the matter of laws relating to pure food and drink. In my judgment you will never get a standard of purity and honesty by State legislation. The law must be uniform and apply alike to all States and be made by the National Government.

Senator HARRIS. Have you had any experience in Michigan—do you ship goods to Michigan?

Mr. BAUDER. Yes.

Senator HARRIS. Suppose these fraudulent goods to be shipped to that State; do you know anything of the treatment that they get there?

Mr. BAUDER. I can not tell you as to that. I know that we have no trouble. I know that Ohio has a very stringent law. When that law was first enacted in Ohio and became operative we were obliged to stamp our champagne, and as one of the other gentlemen stated here this morning, I desire to corroborate him in saying that champagne is the purest of all the wines that are made. It is the king of wines; but we were obliged, for the sake of the little rock candy in the dosage, to put on the bottles a new word.

The CHAIRMAN. The word "compounded?"

Mr. BAUDER. The word "compounded."

Senator HARRIS. How did that operate on the artificially made or carbonated wine?

Mr. BAUDER. I could not tell you; but to show you that these things are not effective I will say that in a little while this thing was abandoned, and we have heard nothing from it since. I think there was just one or two shipments. We took a rubber stamp and put on the labels the word "compounded," and I had almost made up my mind to refuse all orders from Ohio rather than put that word upon our label.

Senator HARRIS. In your experience, did you find that that law or rule was applied to imported champagnes also?

Mr. BAUDER. I was so told.

Senator HARRIS. They all had to do as you did?

Mr. BAUDER. I have no personal knowledge, but I was so told.

Senator HARRIS. Do you have any knowledge as to those wines that are artificially compounded—how they were treated under the law?

Mr. BAUDER. I had no knowledge as to that. I did not hear regarding that matter.

TESTIMONY OF DOUGLAS G. COOK.

DOUGLAS G. COOK, sworn and examined:

The CHAIRMAN. What is your residence?

Mr. COOK. St. Louis, Mo.

The CHAIRMAN. And your business?

Mr. COOK. I am president of the American Wine Company.

The CHAIRMAN. What kind of wine do you manufacture?

Mr. COOK. Champagnes.

The CHAIRMAN. Where are your vineyards?

Mr. COOK. We buy our grapes in the Lake Erie district, near Sandusky.

The CHAIRMAN. What wines do you manufacture?

Mr. COOK. Just one brand; sparkling wine.

The CHAIRMAN. Known by the name of "Cook's Imperial?"

Mr. COOK. Yes.

The CHAIRMAN. Where do you say you buy your grapes?

Mr. COOK. In the islands of Lake Erie—Put-in-Bay, and Kellys Island. We press our juice in Sandusky and ship in the spring of the year to St. Louis. We have our first fermentation in Sandusky.

The CHAIRMAN. You have heard the definition of true champagne as accepted now in the trade, or by men in that business. Do you agree with the gentlemen here who have testified on that subject? Is that your idea of champagne?

Mr. COOK. Yes.

The CHAIRMAN. Do you use any preservatives in your goods?

Mr. COOK. No, sir.

The CHAIRMAN. You manufacture the same champagnes as the other gentlemen here, do you, using the same grapes?

Mr. COOK. Yes. Our superintendent has just returned from Europe, where he was for some months, and he says that he saw no improvement on our methods. He was through all the wine cellars in Europe.

Senator HARRIS. I intended to ask some of the other gentlemen a question that I will now ask of you. How is the difference produced

between what is called sweet wine—sweet champagne—and dry champagne?

Mr. COOK. By adding less sirup to the dry champagne. The dry wine has less sirup than the other.

Senator HARRIS. So that the quality of sweetness is produced by the addition of more sirup?

Mr. COOK. Yes, sir.

Senator HARRIS. And the dry champagne has less added matter?

Mr. COOK. Yes.

Senator HARRIS. But you do not regard that as affecting the question of the healthfulness of the product?

Mr. COOK. Not at all. It is only a question of the palate.

Senator HARRIS. You do not think there is any more headache in one than in the other?

Mr. COOK. I do not. I prefer the sweet wine of the two.

Senator HARRIS. You manufacture both kinds, however?

Mr. COOK. No, sir; we have only one brand.

The CHAIRMAN. Did you ever visit a factory where they carbonate wine artificially?

Mr. COOK. No; I never have done so, but I have been in soda factories and places of that sort.

The CHAIRMAN. You know how it is done in a general way?

Mr. COOK. Yes.

The CHAIRMAN. Do you know how that gas is manufactured?

Mr. COOK. Only from what I understand—from marble dust and sulphuric acid. I understand that it is on the same principle as if you used large quantities of soda water or charged mineral water. It is very bad for the health. It is said that soda water or charged mineral water is not at all good in large quantities; that it is bad for the kidneys.

The CHAIRMAN. How much cheaper could you manufacture your goods, do you think, if you were allowed to carbonate your wine artificially?

Mr. COOK. About \$10 cheaper per case.

The CHAIRMAN. That would save 40 or 50 per cent, would it not?

Mr. COOK. Yes; more than that; nearly 75 per cent of the cost.

The CHAIRMAN. Then the great expense of all in manufacturing champagne is aging and developing its own carbonic-acid gas?

Mr. COOK. Not only that, but the manipulation of the wine in the bottles.

The CHAIRMAN. But you do not have that expense if you carbonate it artificially?

Mr. COOK. Oh, no.

The CHAIRMAN. All that manipulation is done away with when it is carbonated?

Mr. COOK. Yes.

The CHAIRMAN. And all that idle capital is saved?

Mr. COOK. Yes.

Senator HARRIS. Is there a pure-food law in Missouri?

Mr. COOK. I think not; in fact, I know there is not.

The CHAIRMAN. You are the Mr. Cook from whom "Cook's Imperial" is named?

Mr. COOK. Yes.

The CHAIRMAN. You have been in the business a good many years?

Mr. COOK. I succeeded my father.

The CHAIRMAN. As a matter of fact have you, so far as you have learned by experience or through your counsel, any relief in Missouri from the competition of men who make an artificial champagne?

Mr. COOK. No, sir.

The CHAIRMAN. You are willing to market your goods and mark them for just what they contain?

Mr. COOK. Yes; we do mark them now in that way.

The CHAIRMAN. Do you favor a law which would compel your competitors, who make an artificial wine, to mark theirs in the same way; that is, to mark them for what they contain?

Mr. COOK. Yes; I think it will be a very beneficial thing for the public and also beneficial to the general manufacturers of sparkling wines.

The CHAIRMAN. Do you manufacture any still wine?

Mr. COOK. No, sir.

The CHAIRMAN. The principal adulteration, then, in champagnes is by this artificial treatment—whether it is detrimental to health or not, you do not pretend to speak as a chemist or as a physician?

Mr. COOK. No; I could not speak as to that except from what I have heard, that carbonated soda water or bottled soda water is not good for the health. I can not personally say anything on the subject.

The CHAIRMAN. You have no personal knowledge on that subject?

Mr. COOK. No, sir.

The CHAIRMAN. But that it does interfere with the sale of the legitimate champagne you are certain.

Mr. COOK. To the extent that it produces a prejudice against American champagne. That is the main thing. It does not give the genuine article the proper show it should have before our people.

The CHAIRMAN. I suppose this carbonate is sold cheaper, is it not?

Mr. COOK. Necessarily it must be cheaper. There is very little expense connected with it except the original expense of buying the carbonating machine.

Senator HARRIS. Is there a large quantity of it sold in St. Louis, for example?

Mr. COOK. Not now. There was at one time a good deal of it—there was one party there who sold a large quantity of carbonate wine.

Senator HARRIS. But it did not last.

Mr. COOK. It lasted only about two or three years.

Senator HARRIS. But I mean that the people themselves are unable to keep on selling?

Mr. COOK. No. Well, it was not even the best carbonate wine. In a carbonate wine you can take any old wine, no matter what the quality of it is, and charge it up and sell. Naturally, in buying wine to carbonate, they bought the cheapest that they could get. They had to sell it cheap, and if they could get their fundamental wine cheaper, why, the more money they could make.

Senator HARRIS. Not being experienced, people in general would not be able to distinguish the difference in the bottles. I suppose the bottles are put up in the same way and look like the bottles in which there is pure champagne?

Mr. COOK. Yes; it has all the appearance of the other wine. They cap it and label it in the same way.

The CHAIRMAN. Have you any suggestions to make to the committee in addition to what you have stated?

Mr. COOK. No; I think not.

TESTIMONY OF CHARLES G. WHEELER.

CHARLES G. WHEELER, sworn and examined:

The CHAIRMAN. Where do you live?

Mr. WHEELER. In Pulteney, Steuben County, N. Y.

The CHAIRMAN. What is your business?

Mr. WHEELER. I am a producer of champagne.

The CHAIRMAN. Do you make anything besides champagne?

Mr. WHEELER. No, sir.

The CHAIRMAN. What brands of champagne do you make?

Mr. WHEELER. "White Top."

The CHAIRMAN. Do you use anything in your wine to preserve it?

Mr. WHEELER. No; we do not.

The CHAIRMAN. Simply the grape?

Mr. WHEELER. Nothing but blended grapes—different grapes.

The CHAIRMAN. Just as has been testified here by other gentlemen in your business?

Mr. WHEELER. Yes.

The CHAIRMAN. Do you carbonate these in the usual way by aging your wine?

Mr. WHEELER. By fermentation in the bottle.

The CHAIRMAN. Have you ever seen it done in any other way?

Mr. WHEELER. Yes.

The CHAIRMAN. Tell the committee how it is done.

Mr. WHEELER. I saw some of it done about three weeks ago. They use an ordinary still wine. They can use any kind of wine, for that matter—that is, a light-colored wine—whether a true still wine or a sugared wine; that is put into a tank or cylinder; they have attached to that a cylinder of carbonic-acid gas, and they turn that gas on to this wine. The wine at first, of course, is sweetened to the taste or sweetness that they want. They turn this gas on and run it up to a pressure of about 70 or 80 pounds per square inch, and then they revolve it and work this gas all through the wine. Then it is run through a machine to which the bottles are attached, and filled. In this machine that probably occupies a minute or two. Some machines run faster than others. After it is filled they pass it through a corker, and it is corked in the regular way like a true wine and a label is put on.

The CHAIRMAN. While it is being corked a little gas escapes?

Mr. WHEELER. Yes; but it is put on with a heavy pressure, so that they can afford to lose a little. But every twenty minutes or so a man revolves this machine and keeps the gas going through the wine. It is finished in the same way as our wine.

The CHAIRMAN. Have you ever seen a bottle marked in a way that would indicate that it was carbonated artificially?

Mr. WHEELER. Never.

The CHAIRMAN. Does it compete with your wine?

Mr. WHEELER. Well, we don't claim to be competitors of those people; but still in one sense we are competitors. If anybody tells me that he can buy a certain wine cheaper than our wine, why, I say to him that we are not competitors of those people; we are not carbonators. Still, there is no doubt that they are in one sense our worst competitors.

The CHAIRMAN. Is it not your opinion and observation and experience that the consumers largely suppose that this is the same sort of champagne as any other champagne is?

Mr. WHEELER. Certainly. It is put on the market in that way, and it is labeled as champagne, and oftentimes the consumer buys it for a true champagne and pays the highest price; that is, the price of the true champagne. It is sold to the jobber, and the jobber and the grocer may understand that it is not a true champagne, because, as a rule, they can buy any quantity of it for five or six or seven dollars a case, whereas the true wine would be twelve or thirteen or fifteen dollars a case. Where they know it is carbonated, they sell it for less—for one-third, practically—but they do not tell the customer, and the consumer buys it for a true champagne.

Senator HARRIS. The fraud is practically done by the seller?

Mr. WHEELER. Yes. He will sell it for eleven or twelve or thirteen dollars a case until the consumer gets on to it, and then the seller or retailer will sell the same wine for six or seven or even five dollars a case.

Senator HARRIS. The retailer is the beneficiary in that case?

Mr. WHEELER. Yes; of course he is. He has a chance to sell it to the consumer for a true champagne. Of course if it were labeled for what it really is the consumer would not buy it, or at least very few persons would. To be sure, if he wanted it for what it is, that is his business, but there is not 1 per cent of the people who do know.

The CHAIRMAN. You are not asking us to prohibit artificial carbonating?

Mr. WHEELER. No.

The CHAIRMAN. But you people would like to be protected by having the labels state the facts?

Mr. WHEELER. Yes; we would like to have a label on those goods according to what the goods are. It ought to be called carbonated wine, not carbonated champagne, because it is not a champagne. Then, if people want to buy it let them buy it. The consumer is the man who suffers if there is anything wrong.

The CHAIRMAN. What percentage could you save on the cost of manufacture, in your opinion, if you were to carbonate artificially?

Mr. WHEELER. I think it would be about the same as Mr. Cook said. I think he got that about right. A case does not cost more than the expense of carbonating—more than a case of still wine—like a case of sweet catawba, which could be sold very cheap. Mr. Anderson could tell more about that; he is in the still-wine business. Perhaps it would be three or four dollars, or about that.

The CHAIRMAN. You would save, perhaps, 75 per cent.

Mr. WHEELER. Easily.

The CHAIRMAN. If I can carbonate a wine artificially and make the consumer feel or believe that it is a genuine champagne and carbonated by age, I have that advantage?

Mr. WHEELER. Yes; of course they can carbonate any wine, whether old or new.

Senator HARRIS. Can you detect it by the taste?

Mr. WHEELER. A connoisseur can.

Senator HARRIS. Well, I am not speaking of a connoisseur, but people in general.

Mr. WHEELER. The larger percentage of people who drink wines are not connoisseurs.

Senator HARRIS. Everybody assumes to be, but very few people really are so by experience.

MR. WHEELER. That is true. There is another point that ought to be borne in mind. A retail wine man gets a party in and they are drinking maybe an imported wine or a good American wine like Gold Seal, or Great Western, or Cooks, or whatever it may be. They start in on one of them and after a while the dealer will ring in a carbonated wine upon them at the same price. That wine costs the dealer very little and he gets the price of a first-class wine, either imported or straight domestic.

THE CHAIRMAN. That is a fraud on the customers and all the way through?

MR. WHEELER. It is a fraud from start to finish.

THE CHAIRMAN. If you think of anything further that you would like to suggest we should be glad to hear you.

MR. WHEELER. I think the labels that are used by all true American champagne men that are making a straight article are all right. They have the name of the brand on them and the place where the wine is produced, the post-office address, and everything of that kind, and the goods are advertised for champagne and are champagne.

THE CHAIRMAN. You think the brand or label should contain the name of the maker?

MR. WHEELER. Yes.

THE CHAIRMAN. And should state what it is?

MR. WHEELER. Yes.

SENATOR HARRIS. You have examined the brands of these artificial carbonate wines; do those give generally the location of the manufacturer?

MR. WHEELER. Hardly ever. Take the case of some men that I know of. They go to a jobber and tell him what they have. The jobber can understand that these men are in the carbonating business. They ask him what brand he would like to have. He will lay before him thirty or forty different labels—labels for imported brands—those labels can be got from a great many people. He will look them over and say that he will get him up a label—something that appears to be foreign—an Italian label or a French label.

SENATOR HARRIS. Something that does not give any clew to the manufacturer?

MR. WHEELER. Nothing at all in the way of a clew. Perhaps it will have the word "France" on it, or the word "Rheims," or some name of that kind.

SENATOR HARRIS. Do they put up any brands which they sell as their own make?

MR. WHEELER. They put up brands of their own, but they do not have their own name on them.

SENATOR HARRIS. That is what I ask about; do they put up any brand with the maker's name on?

MR. WHEELER. Well, I think there are two that do. I know of two, on reflection, that I am positive of.

SENATOR HARRIS. Two concerns that label their goods in their own name?

MR. WHEELER. Yes.

SENATOR HARRIS. And give their location?

MR. WHEELER. Yes; but they are not producers of straight champagne at all. This carbonated wine is made in every city in the United States to-day. It is made near our place.

Senator HARRIS. In your experience in the trade, can you arrive at any general estimate as to the percentage of the whole quantity consumed, which those carbonated wines would constitute?

Mr. WHEELER. There is a great deal more carbonated wine produced in this country than there is of true wine; and it is growing.

Senator HARRIS. That is what I want to get at, whether this is a large item in the consumption of champagne?

Mr. WHEELER. Yes; it is growing every day. If one goes out of business, another one springs up. One has sprung up in our community within a short time.

Senator HARRIS. It is a matter of magnitude, then?

Mr. WHEELER. Oh, yes; certainly.

The CHAIRMAN. Some imported champagne is treated in the same way?

Mr. WHEELER. Well, I understand so, but I can not say personally as to that. The people that carbonate wine have a great advantage in many ways. They use it as a capital. As you have been told here, true champagne takes years to make. Your money is invested anywhere from three to five years; whereas they can step out and buy their stock for carbonating to-day, and to-morrow they carbonate it, and then it is shipped the next day and sold on thirty, sixty, or ninety days' time. On an average they turn their money over and realize every three months, whereas other people have to tie up their money for a long time.

The CHAIRMAN. If they have any credit at all they do not require any cash capital hardly?

Mr. WHEELER. That is so. I know of one case where a party who was producing a straight wine was asked if he was making carbonated wine. He said that he was, but he was going out of it—that he was not doing much of it. He was asked why he did it at all, and if it was not a bad thing to do—while making a straight wine to still put on the market a carbonated wine. He explained why he did it—because the other, he said, tied up their money so long. They used the carbonated wine as a sort of capital, and they could turn themselves over quickly. It helped them along until they could get into the champagne business, and then he was going to stop it altogether.

Mr. HILDRETH. The only thing that we are looking for is simply to place this question of American champagnes on a square footing. We are perfectly willing to put our labels on our wines, saying, "Fermented in the bottle," and if the others are willing to put on their bottles the word "Carbonated," we shall be satisfied.

The CHAIRMAN. I do not see why you should wish that, because if it be champagne it must be fermented in the bottle.

Mr. HILDRETH. That is the accepted term in the trade, but the carbonated wine is not the same thing. It is a new process of forming wine—it is an entirely different thing. We have got to come into competition with that thing; whether it is healthful or not is a question that people may differ about, but it is certainly imposing on the public. All that we want to do is to be treated fairly and to treat the public fairly.

As to the question of individual State laws, as I said in my evidence, I think that a general national law would have more weight with the individual legislatures of the States and would tend to make those legislatures enact laws corresponding with the national law. If there is

a national law governing interstate commerce the individual States will almost certainly copy those laws to a greater or less extent, and I think that is where the public and the manufacturer will gain.

Mr. WHEELER. I say that as a rule the people in the carbonating business are not wine producers at all. They have no vineyards nor wine cellars. They buy everything. They are what may be called "guerillas."

The CHAIRMAN. They have no regular location?

Mr. WHEELER. No regular location. Many of them are liquor dealers and in other business, like whiskies, etc.

The subcommittee adjourned to meet on the call of the chairman.

COMMITTEE ON MANUFACTURES,
UNITED STATES SENATE,
Washington, D. C., December 21, 1899.

The subcommittee met at 1 p. m.

Present, Senator MASON, chairman.

TESTIMONY OF PROF. WILLIAM FREAR—Resumed.

Prof. WILLIAM FREAR recalled and further examined.

The CHAIRMAN. The committee would like to know something in regard to the organization known as the National Pure Food and Drug Congress. I believe that you have been active in this organization and can tell us its purpose.

Professor FREAR. The history of the organization of the National Pure Food and Drug Congress is briefly as follows: Efforts for the enactment by Congress of measures for the repression of food adulteration have been made at various times during the past decade. Some of these measures which were special in their character—that is, which applied to particular food products or substitutes therefor—reached enactment. There was, however, a great lack of unity in the methods by which the desired result was sought to be obtained. In a number of cases the Continental methods of legislation for each particular method of adulteration by a precise specification was adopted. In others the prohibition of adulterations by classes was attempted, after the English method. Moreover, the suppression of adulteration by absolute prohibition was used in some instances, while in others its repression by taxation was the method adopted.

In the last-mentioned cases the taxes proposed were in some instances simply sufficient to support a system of control, but in other instances it has been proposed to levy such a tax as would practically be prohibitive against the production of a food product entering into competition with an old-established article of food manufacture.

Among the efforts to secure legislation of a broad and fair character may be mentioned that for the enactment of the so-called "Paddock pure food bill."

During all this time, either by special laws for particular products—dairy products may be specially mentioned—or by laws of a more general character, attempts have been made in a number of the States

to secure the suppression of fraudulent dealings in foods and drugs. Among the States conspicuous in such activity may be mentioned Massachusetts, Connecticut, New York, Pennsylvania, Ohio, Michigan, Wisconsin, Minnesota, Iowa, Colorado, California, and Tennessee.

The first steps taken in nearly all of those States were by the prohibition of the sale or mislabeling of certain special food products, such as oleomargarine, diluted milk, etc. But in later years the general tendency has been to enact pure-food laws of a broad scope, such as prohibit the adulteration and misbranding of all food products. In Massachusetts and Maine there have been added distinct systems of control of cattle food products.

The administration of these various laws entered upon the statute books of the several States from time to time has been placed in a great variety of executive officers, and the laws themselves exhibit a great variety of form and requirement, with the consequent disadvantages of confusion and inequality embarrassing interstate commerce.

In 1895 the Association of Agricultural Chemists of the United States—a body organized in 1884 and chiefly composed of chemists of the United States Department of Agriculture, the United States Bureau of Internal Revenue, and of the several colleges and agricultural experiment stations organized under the national acts of 1862 and 1887—appointed a committee to consider what national legislation upon this subject was desirable, if any, the interest of this organization in the subject arising out of the fact that a very large number of the chemists were more and more called upon to serve in food control in the several States to which they belonged.

In 1897 this committee presented a draft of a bill in many respects resembling the Paddock bill; and in the same year, as president of that association, I urged upon its members the importance of agitation for such legislation and for the appointment of a committee to gather the data for the preparation of a system of national food standards.

Acting upon the latter suggestion, the association appointed a committee on food standards, of which Dr. H. W. Wiley, chief chemist of the Department of Agriculture, was chairman. This committee, of which I also was a member, directed me to organize the work of collection of data and definitions in preparation for such a set of standards. I might, in passing, remark that a large amount of compiling and of original investigation has been done by the several referees appointed to consider the subject relative to certain particular classes of food products, and that much of the work is now in readiness for the action of the main committee.

Shortly after that time the Hon. Marriott Brosius, of Pennsylvania, introduced into the House of Representatives during the first session of the Fifty-fifth Congress a bill essentially that which was approved by the Association of Official Chemists; and the Brosius bill was also submitted to the National Farmers' Congress, composed of delegates appointed by the governments of the several States, so far as its essential nature was concerned.

Feeling the necessity for the fullest cooperation of all interests concerned in such legislation, a committee of the citizens of the District of Columbia, composed of gentlemen engaged in the various food manufacturing and trade interests, and in the promotion of the public health and sanitation, formulated a plan for a national conference of all the interests thus affected; and in January of 1898 such a gathering

was held, largely through the able efforts of Mr. Alexander J. Wedderburn, master of the State Grange of Virginia and secretary of the committee of the District of Columbia, whose efforts were seconded strongly by those of a number of the organizations which had previously taken an interest in such legislation.

At that gathering there were present representatives appointed by the heads of five of the national Executive Departments, by the governors of fifteen States, by about fifteen national trade, chemical, and health organizations, and by a large number of State and local organizations. Upon consideration of the work to be done, this conference effected a permanent organization under the name of the National Pure Food and Drug Congress.

The Brosius bill was submitted to a committee of this congress, upon which committee every State having delegates present was represented. After a very careful consideration of all its provisions, it was accepted in a modified form and an executive committee was appointed under instruction to use all effort to secure the enactment of such a measure.

This organization met again in January of the present year (1899), and on further consideration made certain modifications which were regarded as improvements upon the measure, but again affirmed a strong approval of the broad wisdom of its general features, and again called upon Congress for its enactment into law.

It is regarded that that measure, which is framed on the English law and prohibits all adulteration and misbranding of all food products and drugs, is best adapted to meet our present needs, because, as the evidence already introduced before your committee has clearly established, the matters of adulteration and misbranding affect practically all classes of foods and drugs and are so manifold in device that piecemeal legislation must prove inadequate to afford any considerable remedy; and because, in the second place, the legislation will affect equally all interests concerned, favoring none and weighing unduly on none. In the third place, it avoids the tax features which, if simply sufficient in amount to pay the cost of the control, are often interpreted as commanding rather than disapproving the use of certain food substitutes; and, on the other hand, if of sufficient amount to be prohibited, will entirely prevent the introduction of many valuable cheap foods against whose introduction there can be no legitimate objection, except that of the interests of a particular class engaged in the production or manufacture of some old-established article. Finally, the method of executive control which is proposed avoids as far as may be the endangering of trade interests and the increase of expenditure by the creation of new political offices, and seeks instead to use executive machinery already well established.

The objects of the National Pure Food and Drug Congress and the measure which it approves in its original form, together with a list of the interests represented in its membership, are shown in a memorial introduced by Senator Faulkner, of West Virginia, in the Fifty-fifth Congress, second session, as Document No. 233. In its form as amended at the second session of the Pure Food Congress, and further, as a result of conference between its officers and the members of the House Committee on Interstate Commerce, to whom the Brosius bill was referred, it will be found in Senate bill 4144, Fifty-fifth Congress, as reported from the Senate Committee on Agriculture and Forestry, and accompanied by a report from Senator Hansbrough,

chairman of the subcommittee having charge of the measure, as Document No. 1380.

The CHAIRMAN. The National Pure Food and Drug Congress, through its legislative committee, and through its executive committee, have proposed certain minor changes in the original bill, and I would be glad if you would for the benefit of the committee explain these changes.

Professor FREAR. At a meeting of the executive committee of the National Pure Food and Drug Congress, held December 19, 1899, a number of changes were made in the way of amendments to the measure as approved by this organization. These changes were for the most part improvements in verbiage for the sake of increased clearness and definition in the measure. Aside from such changes, there was one other change, made to conform to a recommendation submitted by the Secretary of Agriculture in his late report to the President of the United States relative to the status of the Division of Chemistry in his Department. This change consists essentially in providing for the organization of a bureau of chemistry to have charge of the work at present performed by the Division of Chemistry, of the work assigned to it by the provisions of the original Brosius bill, and of such other chemical work in collaboration with other Departments of the Government as may be requested by their respective heads from the Secretary of Agriculture. A copy of the measure in this final amended form will be presented to your committee by Dr. H. W. Wiley, chairman of the committee on legislation of the Pure Food Congress, who acts by instruction of the executive committee.

The CHAIRMAN. I understand that in the matter of administration the Secretary of Agriculture should be consulted. Has the proposed change in regard to administration met with his approval?

Professor FREAR. This change relative to the organization for the executive management of the proposed control has been made after specific conference with the Secretary of Agriculture and with his distinct approval.

The CHAIRMAN. The committee would be glad to know what your own personal experience has been in connection with the work in Pennsylvania relative to food adulteration, both as an analyst and as an adviser of the administration of the law.

Professor FREAR. As chemist to the State department of agriculture of Pennsylvania and as secretary of the board of chemists to the State Dairy and Food Commission, it has been my duty to assist in the examination of food products, samples of which were collected under the various food laws of that State, and to witness the effects of the execution of such laws.

Prior to 1895 there had been enacted a number of laws relative to the sale of milk, oleomargarine, and vinegar, but in 1895 the legislature of the State enacted a general pure-food law based upon the English laws; and since that time, when adequate provision was made for the enforcement of the law, a very general examination of food products sold in various parts of the State has been made. The result has been to reveal a very widespread introduction of adulterated materials and misbranded goods.

Upon an examination of the vinegars sold in the mining regions of central Pennsylvania several years since, I found that of those sold as cider vinegar nearly three-fourths were, instead, low-wine vinegars,

artificially colored. A number of samples of vinegar made from the wastes of sugar refineries have also come to my notice, bearing the brand of cider vinegar, and, more recently, to avoid the simpler methods used for the detection of the above-named substitutes, there has been produced in the State a large amount of low-wine vinegar, to which the standard amount of solids has been added in the form of cheap apple jelly made from the parings left as residues in the manufacture of desiccated apples.

The adulteration of spices is very general, and a very large proportion of the samples of cream of tartar examined by me were found to consist either of terra alba, or terra alba with a little free tartaric acid, or cream of tartar diluted with terra alba, or of acid calcium phosphate.

The sale of oleomargarine as butter was pretty common.

A very large fraction of the flavoring extracts were spurious.

The coffees were also in a very large measure made up of coffee substitutes, often very ingeniously prepared.

The department has not attempted any extensive examination of the drinks sold in the State, and the examination of drug products is not comprised in the duties devolving upon the department of agriculture of the State.

The result of four years of operation of the law of 1895 has been a very large reduction of the number of food substitutes offered under false brands in the State of Pennsylvania, but sophisticators are constantly introducing new substitutes and adopting new devices for the evasion of the legal requirements. The cost of so doing, however, is naturally increased, and the number of sophistications now found is much less than formerly was. Public sentiment, too, has constantly grown in support of the effort to repress the sale under misleading names of food preparations. There is, nevertheless, need of constant watchfulness by those trained to the work to prevent the rapid development of the sale of such materials.

THE CHAIRMAN. Will you now state for the benefit of the committee your observations in regard to the administration of the Pennsylvania State law relative to food adulteration, and also mention any difficulties which you may have found in the way of administration? Will you also state your opinion of the proposed measure as approved by the Pure-Food Congress and its executive committee.

PROFESSOR FREAR. In the workings of the State law, both in Pennsylvania and in other States, with the operation of whose food laws I have gained some familiarity, there are several very pronounced difficulties.

In the first place, the burden of prosecution necessarily falls first, and often altogether, upon the retailer. He is undoubtedly in many instances guilty of knowingly offering for sale spurious and misbranded articles, but there are many cases in which he himself is the victim of misrepresentation, and in cases where the goods have been purchased from jobbers or manufacturers living without the confines of the State of which he is a resident he has practically no redress. There is too considerable a proportion of cases of this character to permit the matter to be passed by with indifference as of that class of injustices which the practical working of human affairs is unable wholly to prevent.

Another difficulty is also found in the fact that goods offered through the State in original packages are, under the decisions of the Supreme Court of the United States, not within the control of State officials,

and the difficulty is further increased by the fact that there has never been a decisive interpretation of this decision to define the nature, size, etc., of an original package.

This difficulty is further enhanced by the increased practice of putting up in the factory itself the manufactured products into small and convenient sealed packages, which are never broken by the retailer, instead of their transportation in bulk to the retailer, as was formerly the practice.

Owing to those difficulties, and to the need of some widely recognized pattern upon which legal regulations and local standards might be based, it is clear that a national law governing the commerce between the States would prove a most valuable supplement to the existing State legislation on the same subject, permitting the relief under proper guaranty of the retailer from existing injustice, the control of sales in original package, promoting the general unification of food-control legislation, and the execution of State laws.

The Association of State Dairy and Food Commissioners, which met in October, 1899, in Chicago, passed a resolution urging the enactment of the measure advocated by the National Pure Food and Drug Congress as best adapted to secure these desired ends without in any way interfering with that police control of commerce that is entirely within the confines of the several States, which has been specifically reserved by the Constitution of the United States to the State governments.

Aside from the great value of such a law as supplementing the legislation of the several States, it should further be considered that such legislation, of a wise and uniform character, is greatly needed for the protection of legitimate commerce within the Territories, over which the Congress of the United States has exclusive control, and also that the legitimate food products prepared and produced by residents of the United States are subject to severe competition with cheap, misbranded, and adulterated substitutes, which are imported to our markets from foreign lands; and that for protection from such competition the various interests concerned must look to Congress alone; and, finally, it is a subject that has in recent years been frequently called forcibly to the attention of American producers and manufacturers, because of the exportation into our best markets of inferior, misbranded food products, prepared by a few of our citizens and offered abroad at the cost of American reputation for business honesty, and of the consequent control, or even exclusion, of important groups of American food products from markets which have hitherto been among those in which the American producer secured his highest aim.

So that the honest manufacturer and producer must look again to Congress for the protection that his interests so much need against the attacks on his foreign markets made by unscrupulous men in our own land.

The measure advocated by the National Pure Food and Drug Congress in its latest amended form has been carefully drawn so as to include within its scope all the objects above mentioned, and we trust that your honorable body, upon a careful consideration of the facts secured by your investigation, and of the representations made in behalf of such a representative body as the National Pure Food and Drug Congress, may be led to recommend the enactment of the measure we have advocated.

The subcommittee adjourned subject to the call of the chairman.

WASHINGTON, D. C., December 22, 1899.

The subcommittee met at 10.30 o'clock a. m.

Present: Senators Mason (chairman) and Harris; also, Dr. H. W. Wiley, of the Agricultural Department.

STATEMENT OF PROF. PETER T. AUSTEN, Ph. D.

Dr. AUSTEN was sworn and examined as follows:

The CHAIRMAN. What is your name, residence, and occupation?

Dr. AUSTEN. My name is Peter T. Austen; I reside in Brooklyn, N. Y., and my profession is that of chemist.

The CHAIRMAN. Please mention what experience and training you have had.

Dr. AUSTEN. I was graduated from the Columbia College School of Mines in 1872; studied several years in Berlin under Professor Hoffman; came back to this country and filled the chair of chemistry at Dartmouth College. Later on I was professor of chemistry at Rutgers College and the New Jersey State Scientific School, and later in the Brooklyn Polytechnic Institute. I am a member of the chemical societies of Germany and England, and was presiding officer of the New York section of the American Chemical Society for three years. I have been a member of the chemical societies of France and Russia. I have also occupied the position of chemist to the boards of health of Richmond County, N. Y., the city of Newark, N. J., and the city of New Brunswick, N. J., and also to the joint board of the Newark (N. J.) aqueduct board and the Jersey City department of city works. I have also been State chemist of New Jersey, and chemist to the New Jersey State board of agriculture. Before the consolidation of the cities of New York and Brooklyn I was civil-service examiner in chemistry for the city of Brooklyn.

I should explain that it was expected that Prof. Austin Flint and Dr. E. E. Smith, of New York, would be able to appear with me to-day, but it was impossible for those gentlemen to come, and therefore it was thought advisable that I should, in addition to what I may be able to say myself, submit some results of certain work they are doing.

To explain my connection with this matter, I wish to state that some time ago I was asked by several prominent manufacturers of alum baking powder to look into the state of the literature and art and to report to them the result of my studies, particularly as to the experimental side of it. In consequence of that request I went over the literature very carefully, read the various articles, and looked up the references, and formed an opinion about the condition of the subject. I found that there is a very large amount of printed matter bearing upon the use of alum in foods and baking powders, and especially as regards baking powders. I found that there had been for some years what might be called a general education of the public as to the harmfulness of alum when used in baking powders. Most of this matter was published in newspapers and journals, and I found that it was not properly reading matter, but matter paid for as advertisements, and that many of the journals which had published the articles had made contracts with the various cream of tartar baking powder concerns which in effect did not allow them to publish any matter that was contradictory

to the paid reading matter published by them. I concluded, therefore, that such reading matter was properly advertising matter and hardly entitled to scientific respect.

I also read a good many articles the gist of which was that the use of alum in baking powders was injurious, because it was alum, the inference being that the alum would exert the same effect on the human system whether it was taken as alum or taken in the form of food prepared with alum baking powder. That was reiterated in a great many ways. Statements of an analogous nature were made about cream of tartar baking powders, in favor of its healthfulness, to the effect that cream of tartar being a product of the grape, it was eminently proper and healthful to use baking powders made of cream of tartar. Those appear to me to be entirely paid advertising statements and not meriting scientific respect.

I also found a certain number of published reports containing more or less of what might be called experimental investigations by scientific men, and these were opposed to each other in various ways. Some of those, it seemed to me, had been made with a definite intention to answer a certain question, whatever it might be, but they did not appear to really answer the questions involved. I found articles, for instance, giving the effects of various substances, such as the hydrate of alumina, which is produced when alum baking powders are used in the preparation of food; and similar experiments. Those, again, I did not consider as constituting scientific proof, because the question was not whether the hydrate of alumina, in the case of alum baking powders, or the Rochelle salts, in the case of cream-of-tartar baking powders, was or was not harmful in large quantities, much larger than one would possibly get in eating food prepared with those powders, but the real question was whether the food prepared with the various baking powders was harmful or not.

There has also been considerable attention drawn to the effect of alum as a poison, as well as other substances, but as Professor Chittenden said when appearing before your committee in New York, the use of the word "poison" is very indefinite. Almost any substance is a poison if you take enough of it. Baking soda, yeast, alum—almost any substance, even apples, if you take enough will produce physiological disturbances. We ought to confine ourselves entirely to the quantities in which these substances are taken normally and not consider whether baking powder, or baking soda, or any substance used as a food or in the preparation of food, is a poison when taken in excessive or abnormal amounts, but what the effects are when taken in such amounts as would naturally occur in food prepared by their use. We have a large use of borax and salicylic acid in the preparation and preservation of food, but so far as I know no injurious effect has been traced to their use. Wintergreen is a common flavor and is a salicylic acid compound. In the amount taken as a flavoring it does not produce, so far as I know, any injurious results.

Senator HARRIS. Let me ask you a question. While the amount each time may be small, have you considered the effect of the continued use of small quantities?

Dr. AUSTEN. Yes; but where it is not a cumulative substance there is no reason to suppose that you get any effect. Cream of tartar, taken in sufficient quantities, produces physiological effects. It produces griping if taken in sufficient quantities. You can eat a pound

of grapes a day, and in that way get quite a quantity of cream of tartar; but it is not, so far as I know, a cumulative substance.

In taking mercurous chloride, or calomel, or certain poisons of the type which when taken in minute quantities produce physiological effects, you have to be careful that you do not exceed a certain amount a day; otherwise you may get a cumulative effect. I have not found any proof that hydrate of alumina in small amounts produce a cumulative effect. I have gone over the literature carefully and have consulted gentlemen who stand very high in their profession, but I have not been able to find that borax or boric acid or salicylic acid or the bisulphites in minute amounts, such as occur in food products, produce a cumulative effect. I have not been able to find any experiments establishing this.

I suppose, Senator, it is so well understood how the alum baking powder acts that it is hardly necessary for me to enter upon that subject?

The CHAIRMAN. There has been quite a large amount of evidence on the subject. Whatever you think ought to go in to make your evidence connected we will be glad to have.

Dr. AUSTEN. I will say briefly that the action of an alum baking powder is this: When the alum is mixed with bicarbonate of soda, moistened, and subjected to heat, a chemical reaction takes place which results in the evolution of the carbonic acid gas, which inflates and leavens the dough and produces, as a side product, sulphate of soda and what is commonly called the hydrate of alumina. Those comprise the residuum which is left in the bread. This idea is applied in various ways to generate gas.

In cream of tartar baking powder the acid bitartrate of potassium, which is cream of tartar, is mixed with bicarbonate of soda and water, and also evolves carbonic acid gas. The residuum that is left in the bread in this case is what is commonly termed rochelle salts. Or, dough can be mixed with bicarbonate of soda and a carefully measured quantity of hydrochloric acid, which causes an evolution of carbonic acid gas and leaves a residuum consisting of common salt. Any substances which will evolve carbonic gas, under proper conditions, not too quickly, and leave an innocuous residuum, could be used as a baking powder if practical as to cost and other conditions.

Alum is also used very largely in the filtration of water—to the extent of hundreds of tons. The reaction is the same, but applied in a different way. In the water, instead of bicarbonate of soda, there is bicarbonate of lime and with this the alum enters into chemical reaction. Carbonic acid gas is evolved, but it stays in solution in the water. Gelatinous hydrate of alumina is precipitated, and tangles up the fine suspended matter, agglomerating it and making masses large enough to be removed by the filter bed. The turbidity which would filter through a sand filter without clarification by the action of the alum is coagulated and forms masses easily removed by the sand filter bed. The filter bed is washed by reversing the current. Those filter plants are used in Atlanta, in Kansas City, and in many other places throughout the country for filtering water for use in cities, and for manufacturing purposes. It is known as the coagulo-filtration method and it is carried out on a large scale.

Bills have been introduced in various States making it a misdemeanor to use alum in the preparation of food. Such a law would naturally

affect this method of filtration of water, in which millions of dollars have been invested for city plants, because water is a food and is used in the preparation of food, and hence under such laws the sale of alum to filtration plants would become a misdemeanor, and is so now under the Missouri law.

The CHAIRMAN. What States prohibit the use of alum?

Dr. AUSTEN. In the State of Missouri there is a law which makes it a misdemeanor to put into food any substance containing arsenic, calomel, bismuth, ammonia, or alum. I do not know why calomel or arsenic should be specified. I never heard of arsenic or bismuth or calomel being used in the preparation of food. Such a law was passed in Missouri and there is a case under it now pending. A bill for exactly the same law was introduced in the Georgia legislature last month but was not passed.

A bill to enact a law precisely the same in its wording is now before the legislature of Virginia, and I have been informed that similar bills were to be introduced in the legislatures of Massachusetts, New Jersey, New York, Connecticut, and perhaps some other States. It is understood that bills of this nature will be introduced in all legislatures where it is practicable, as nearly as possible at the same time.

Of course this is an instance of manufacturing legislation, the bills emanating from one source. It is an attempt to gain the assistance of State legislation in preventing the sale of competitors' products.

I may say here that if any legislation at all is required, it should be framed to protect the interests of the public, and not one of several rival manufacturers. It should be based entirely on the residuum left in the food, for the reason that no matter how bread is made, the substances which are going to affect the people who eat the bread are not what is put into the bread, but what is left in the bread. For instance, you use yeast. It does not make any difference whether yeast is a poison or not. If you drank a pint of yeast you would be in a most unfortunate condition, but when bread is made with yeast you do not eat the yeast, for there is no yeast left in the bread. It is destroyed in the preparation of the food.

You do not eat cream of tartar when bread is made with cream of tartar baking powder; nor, when it is made with alum baking powder, do you eat alum. You eat some Rochelle salt in the case of cream of tartar bread, and a little sulphate of soda and hydrate of alumina, if that is what they are, when the bread is made with alum baking powder. If the residuum is harmful, then legislation is needed. But legislation directed against what is put into the bread, and which is altered or disappears in the finished product, does not solve the problem or necessarily protect the public. It is just like the use of sulphurous acid in cider, which is a common practice on the farm. So far as I have been able to ascertain, the cider after a little time does not contain any sulphurous acid. It is converted into sulphuric acid, which combines with the bases present and remains in a harmless condition.

I do not think it is necessary to say anything here about the harmfulness or harmlessness of alum, because it does not enter into the food product. Bread properly made with our alum baking powder has not been shown to be injurious. I say "properly" because I do not think it is fair to take as a subject of comparison an article of food which is improperly made, for bread can be made very badly with ordinary yeast or anything else. Bread made with alum baking powder does

not contain, so far as I have been able to ascertain, any unchanged alum. Neither does bread made with cream of tartar baking powder contain cream of tartar; nor does either contain baking soda. It is entirely converted; so that there is no use of spending time in considering so far as this matter is concerned, whether alum itself is harmful or harmless when taken in considerable quantities, because there is no alum left in the bread made with alum baking powder.

In looking over these matters carefully I came across some references to the nature of the effects of residues left in bread when alum baking power is used. Several authorities have stated that the hydrate of alumina left in bread is perfectly harmless. Dr. Petraeus states that experiments have been made by various parties which have led to the conclusion that under practical conditions it is harmless. The minute quantity of sulphate of soda left in a loaf of bread is so small that it can be overlooked. In fact it is claimed now that it is rather a necessary article in digestion. It has been stated by the Grape Nut Company, who are advertising very largely their grape-nut food, that one of the most advantageous points in their grape-nut is the presence of a certain amount of sulphate of soda.

At all events, I think we all agree that this factor can be omitted, for it is so extremely small that I do not think any trace of a physiological effect can be obtained from it one way or the other. It is not worth while to consider cases where a food product contains so small an amount of a substance that to eat enough of that food product to get a physiological effect from that substance is going to upset your entire digestive system. If you were to eat four loaves of bread at a sitting, you would have no means at all of deciding which particular ingredient made the most trouble.

There is another interesting point which has to be taken into account when the analyses of bread are studied, and that is the presence of alumina in the flour itself. I have not had an opportunity to study the subject much; but Dr. Sutton, who is an English chemist of eminence, states that that substance is found in almost all flours. He states that in almost all flours he analyzes he finds a certain amount of alumina. I have not been able to find any reference to it in this country. It probably comes from the millstones. I imagine that flour will not be condemned on account of the presence of alumina in it.

The CHAIRMAN. It might come from terra alba or barytes.

Dr. AUSTEN. There is not much flour adulteration now.

The CHAIRMAN. There is not so much now, but we found large amounts of it a year ago.

Dr. AUSTEN. Yes; there have been cases where it has been adulterated.

The CHAIRMAN. I will tell you, for your information, that the Government has found over 11,000 barrels in the last twelve months under the bill of last year.

Dr. AUSTEN. Of terra alba?

The CHAIRMAN. Yes.

Dr. AUSTEN. It is a very handy article for the adulterator.

I also found certain experiments on the effects of what has been termed "baking-powder residuum." Professor Mallet, an eminent authority of Virginia, made a set of experiments in which he prepared the residuum from alum baking powder by simply warming it with water, collecting the insoluble residue, which consisted of hydrate of

alumina, and heating it to the temperature which he states exists in the center of a loaf of bread. He then ate quite large quantities of it, and noted the effect produced upon himself. His conclusion was that it produced an oppressive sensation. He thought it gave him indigestion. I am very frank to say that I do not think the experiments are of much weight, etc.

Dr. C. A. Crampton, in Bulletin 13, part 5, of the Chemical Division of the Department of Agriculture, makes the following statement in regard to Mallet's experiments: "I may say that most of those based on purely chemical work I can indorse, having confirmed many in my own work; but I think the evidence furnished by his physiological work is hardly sufficient to justify his conclusions as to the harmfulness of such powders."

Dr. Mallet is an eminent man, but he is not considered to be a physiological chemist; and I question whether one who is not accustomed to experimenting on himself is in a position to observe accurately the effects of a substance on himself.

I think if any man not accustomed to such experiments were to eat a certain substance and think, "Is this affecting me in one way or the other," he would probably feel something unusual. Violent diarrhea has been produced by a glass of water with a suggestion that it would produce that effect. There are cases on record where constipation has been cured, or at least mitigated, by feeding pills of bread with the suggestion that they would produce a violent effect. I think the experiments of Dr. Mallet are not applicable here, particularly because (and I want to make this very clear) it seems to me there is just one question in this whole matter, and it is not whether alum produces an effect upon the human system, or whether the residues of alum powders produce effects harmful or harmless, but whether the food as popularly made with alum baking powder is or is not harmful.

Senator HARRIS. Did you say "popularly" or "properly" made?

Dr. AUSTEN. Popularly; as it is ordinarily made in the household.

Senator HARRIS. I did not understand whether you said "popularly" or "properly."

Dr. AUSTEN. Let us assume that the bread is made properly. The food made and used throughout the country, as a rule, is. But the question is, Is the food made and used throughout the country with alum baking powder healthful or unhealthful? That seems to me to be the only real point under consideration and the one which must be determined by actual experiments. While experiments made with the chemicals or the residuum from baking powders may be inferential, at the same time I do not think they can be fairly considered as proofs. I do not think, for instance, that you could fairly infer what effect an apple would have upon you by studying the properties of malic acid. It is not the fair way. While Professor Mallet's experiments are interesting, he would not be in a position to say what would be the effect upon you or upon me of food prepared with the use of alum baking powder. His experiment on himself ought to have been accompanied with analyses of his feces, etc. Suppose one of us should eat a lot of mince pie and then keep thinking about it, might not a sensation of oppression be noticed? But would that condemn the general use of mince pie? Dr. Jenkins, a most eminent chemist, who appeared before your committee, stated that he personally could not eat sugar. Suppose Professor Mallet can not eat hydrate of alumina, or Dr.

Jenkins sugar, what does it prove? I do not think such experiments establish our point, which is whether a food made with alum baking powder is harmful or not. If it is, it ought to be prohibited by law. If it is not, I think that so important an industry ought to be allowed to continue.

The CHAIRMAN. Who is Professor Mallet?

Dr. AUSTEN. He is connected with the University of Virginia.

The CHAIRMAN. He has not been before this committee?

Dr. AUSTEN. No, sir. He has made a great reputation in technical chemistry. He is the inventor of a process of making oxygen, which was one of the first and most noted ones. I do not think that he considers himself a physiological chemist. Physiological chemists comprise a very small class in this country. It is a comparatively new subject and an extremely difficult one. It requires a very elaborate outfit in some ways. One has to experiment on animals and human beings. One has really to be a physiologist, a chemist, and something of a physician.

If you want an investigation made on that subject you will find very great difficulty in getting anybody in the country to do it, and if an expert can undertake it it is very unlikely he can do it within a year of the day called on. We have several in this country—Professor Atwater, for instance, whose work is connected with the State government; Professor Chittenden, of Yale, perhaps the most eminent physiological chemist in certain ways. A younger school is rising, comprising but a few. I do not think there are more than six or eight men competent to do it. That is one reason why the study of this subject has not advanced. The chemists have made many analyses, and they have fed pigs, cats, and dogs hydrate of alumina or anything else they may have thought of, and then have made inferences; but that does not answer the one question which I maintain is the crucial one, Do the bread or food products made with alum baking powder produce harmful results?

I have here an abstract from which I could quote opinions of various parties, eminent men, who state that hydrate of alumina has no bad effects; that alum baking powder produces bread which is perfectly healthful, and so on; but, as I say, I think most of these results have not been obtained from the kind of investigation which it seems to me represents the state of the science and the art.

One of the latest statements about the entire harmlessness of bread made with alum baking powder has been made by Dr. Henry Froeling, of Richmond, Va., dated July 24, 1899, in answer to a request from the Hon. G. W. Kiner, commissioner of agriculture of Virginia. The request was as follows:

There has been considerable discussion and inquiry about the comparative healthfulness of baking powders containing alum and those containing cream of tartar, and to encourage and foster manufacturing enterprises in Virginia, there being a large amount of money invested in this State in the manufacture of these baking powders, giving employment to hundreds of people, this department considered it to the public interest to investigate this matter. To ascertain the facts I have had samples of baking powders made of alum, of Virginia manufacture, analyzed by one of the ablest analytical chemists of the country, Dr. Henry Froeling, of Virginia. His report, which follows, shows that our Virginia-made baking powders are as healthful as other brands of baking powders costing four or five times as much.

I want to say that I am not here to criticise any other kind of baking powder. I do not want to say that any baking powder is bad.

The CHAIRMAN. I think your statement at the opening was very fair—that you appear here at the request of certain alum baking-powder people.

Dr. AUSTEN. Simply to endeavor to show that their product does not make an unhealthful food.

Dr. Froeling concludes by saying:

From my experiments, carefully made, a well-compounded baking powder with alum as an ingredient in the recognized proportions is as harmless as the best cream of tartar powder; indeed, it is less harmful, as the cream of tartar powder leaves in the bread a large residue of tartrate of potash and soda (rochelle salts).

I find that well-compounded baking powders with alum as an ingredient give a leavening effect fully equal to the higher-priced baking powders costing four or five times as much.

There was formed what is known as the American Baking Powder Association, which is an association of the manufacturers of alum and phosphate baking powders, and one of their objects was to make a thorough investigation into the matter and find out, if possible, what the facts were. I was asked by them to take charge of the scientific work, and I reported to the association that there was just one thing to be done, and only one thing, and that was to find out whether the food made with alum baking powder was or was not harmful; that I could make analyses and feed all sorts of animals and human beings with hydrate of alumina and other substances, but even then I should only be able to infer as to the healthfulness or harmfulness of the food made therewith. So I strongly advised that experts should be retained who could make a study, chemically and physiologically, of food made with alum baking powder. My suggestion was adopted, and I was authorized to retain such experts as could be found to undertake the investigations.

It was a difficult matter, at the moment, to begin the experiments, but I finally succeeded in retaining for the work a man whom I consider to be preeminently distinguished, Prof. Austin Flint, whom I take to be one of the most distinguished physiologists living. The name of Flint is well known all over the country. He told me the other day a fact which interested me, that there are practicing in this country 5,000 physicians who have been his students. I think that is a very unusual record.

To satisfy myself at the start as to the nature of this investigation and just what we ought to determine I submitted two questions, which are these:

In your experience as a physician, who has given much attention to the subject of indigestion, have you ever had a patient whose diseased condition of the digestive system, in your opinion, could be attributed, either wholly or in part, to the use of alum baking powder in the food?

Or have you, in your experience as a physician, ever been led to attribute any functional disorder or diseased condition to the use of alum baking powder in food?

Dr. Flint says:

In answer to both of the above questions I reply that I have not.

Professor Flint is a man of great eminence and very wide knowledge of medical practice, and I was led to believe from this statement that the matter of a specific form of disturbance of the digestive system, resulting from the use of food prepared with alum baking powder, might be excluded from our studies. We therefore did not have to look for any special diseases arising from its use. I also retained

in the matter Dr. E. E. Smith, formerly instructor in Yale College and assistant of Professor Chittenden, and who is now an independent physiological chemist, making a specialty of the analysis of physiological products and studying them chemically and investigating all matters relating to physiological chemistry.

Dr. Smith started at once to carry out certain experiments which Dr. Flint, Dr. Smith, and I discussed and agreed upon as most efficacious or most likely to indicate the results we wanted to get at, using a good type of alum baking powder—that is, a popular type—and getting the powder in the market and making with it bread, Dr. Smith making it himself, under proper conditions, and using that bread as the basis for his experiments.

It was necessary to get a standard for comparison. With that object in view we decided that we would make what we would call a control or normal bread; that is, a bread made with hydrochloric acid and bicarbonate of soda, properly weighed out in their proper proportions. Made under those conditions we would have a bread which would contain absolutely nothing extraneous to the flour and the usual additions except a small amount of salt, which is produced by the action of the hydrochloric acid on the bicarbonate of soda. That was our control bread.

These breads were made by Dr. Smith himself, very carefully, and they were reduced to crumbs and sampled, so that the material would show an even composition. The first experiment was made with artificial digestion, known as proteolysis, with pepsin-hydrochloric acid, using hydrochloric acid and a solution of pepsin. I will not weary you with the figures unless you wish them, but the idea of the experiment was that a certain amount, an equal amount of the alum bread, we will call it, and of the control bread were mixed in water, placed in water heated to the proper temperature and agitated, and then a certain amount of the hydrochloric acid and pepsin was added at different times. After forty-eight hours the undigested residue was separated by filtration, washed, and the amount of nitrogen in the filtrate and residue was determined. The result of the experiment was that the alum bread left 99 per cent in nitrogenous material undissolved and the control bread 98.85.

That was well within the limits of error, being only a small amount, fifteen hundredths of 1 per cent. I should say, by the way, that in these physiological experiments we are allowed a little more leeway in checking than we are in the analysis of ore, where we come out very close. We consider that practically a perfect agreement. In other words, in the alum bread there was 1 per cent of nitrogenous matter dissolved, and in the control bread 1.15. They were practically the same, showing no difference.

Having established that point to our satisfaction, the next experiments were made upon human beings, and in the same way bread was made with alum baking powder and the control bread was made in the same way with bicarbonate of soda and hydrochloric acid. Those were the two breads used all along. Then the human being was got into a proper normal condition and was fed with a diet of determined composition, consisting of the two breads and meat, milk, butter, and water, so as to give him an average diet. At the conclusion of the experiments he was given doses of lampblack, so that the color of the feces would determine the passage of the last amount of substances through

him. His feces and urine were collected and analyzed. We were unable to find any appreciable difference between the effects of the alum bread and the control bread. In the case of alum bread the nitrogen of the feces gave 4.237 grams and the control bread gave 4.759; that is, the per cent of available nitrogen in the feces from the alum bread was 90.8 per cent and in the control bread it was 90 per cent. These results are practically the same.

Of course, it is needless to say that in a human being it is not easy to get perfect checks, for the reason that a man does not always excrete the same, and because of the difficulty of collecting the feces, and so on. From a chemico-physiological standpoint these two analyses are perfect checks. Indican in the urine in both cases was of moderate amount. The sulphates combined with aromatic compounds in the case of the alum bread were 0.556 grams and in the control bread 0.528 grams. I may also say that a number of experiments are still under way and can not be reported upon at this time. It is very slow work. It takes several weeks to make one of these experiments satisfactorily, and there is an immense amount of analytical work involved.

The next set of experiments—these are also under way, using several human subjects—was to ascertain the influence of the bread made with alum baking powder on the secretion of the gastric juice. These experiments were difficult on account of the trouble in securing men to submit to them. We succeeded in getting several men who are normal, and I consider that they are excellent subjects. They are either young doctors or medical students who take an interest in the experiments. They are not told what they are given. I consider that quite important. If I gave a man water and told him it contained a cathartic he might show some cathartic effect. They are given 60 grains of one bread or the other bread and a certain amount of water. They come in the morning; they have had nothing to eat, and they are fed with these materials, and then exactly an hour afterwards their stomach contents are pumped out and analyzed.

Without wearying you with the figures, the results of these experiments show that there is no appreciable difference between the influence of the control bread and the influence of the alum-made baking-powder bread on the secretion of the gastric juice. It is practically the same. Dr. Smith sums up his results of these experiments in his conclusion, as follows:

In the experiments, the results of which are here briefly outlined, no difference was manifest in the influence on the digestive process of the Layton (alum) bread and the control bread. So far as has been observed, then, the residue resulting from the use of Layton alum powder has not diminished the digestibility of the food product or interfered with the digestive process.

That is as far as our experiments have gone. By the 1st of February we shall have reports on a number of others.

But, as I said at the start, I am strongly of the opinion that the only real question to be answered is whether food products made with alum baking powders are harmful or harmless, and this can only be determined by physiological, or what may be called chemical physiological experiments made on the food products themselves. I consider that much experimental work done with the various chemicals is not reliable. The results can be used only as inferences, and inferences

have been made from them that are not justified. I consider the class of work which is done on the food products by a physiological chemist, working with a physiologist, the only kind of experimental work which really solves the problem and answers the question as to whether alum baking powder is or is not a harmful substance when used in the preparation of food. That is about the gist of what I wish to say. I am very sorry that Dr. Flint and Dr. Smith could not be here, because they are both enthusiastic about their work, and of course could give you more details than I can, although I am following their work continually and know what is being done.

I may say that many eminent physicians have signed answers to the questions which I read to you. I wanted to feel before I went into this matter and while I was in it that I had not to deal with some specific disease or functional disturbance caused by food prepared with alum baking powder. If that were the case we should institute investigations at once on that subject; but I have not been able to get from the most eminent physicians in New York and several other cities an opinion that anyone has ever observed any functional disturbance which could be traced to the use of alum baking powders when used in the preparation of food. I considered, therefore, that the experiments that have been made under my direction and are being made were the ones called for and were crucial and final. As I have said, we have been absolutely unable to find, by most carefully and exactly conducted chemico-physiological experiments, the slightest difference in results between control bread free from any residuum except salt and the bread made with alum baking powder.

The CHAIRMAN. Senator Harris, do you wish to ask any questions?

Senator HARRIS. Yours has been a very interesting statement, Doctor. Of course you have dealt, in your experiments, with a baking powder prepared in a scientific manner?

Dr. AUSTEN. Do you mean with the control bread?

Senator HARRIS. No; I am speaking of the alum baking powder.

Dr. AUSTEN. The baking powder used in our experiments was made by the Layton Baking Powder Company in St. Louis. The reason why we happened to select that powder was that the Layton powder is the one which is going to come up in the first case in Missouri, under the Missouri law, and the powder had been analyzed with great care by Professor Kaiser, of the University of St. Louis, which saved us some of the analytical work. We would have taken any other powder, but the Layton is a well-known powder and appears to be a very fair type of the alum baking powders sold on the market.

Senator HARRIS. In determining the question of residuum, in the first place, before you proceed to ascertain its effects—in other words, in arriving at the fact as to what there is in the way of residuum—you have to deal, taking the question broadly, with powders prepared in a great many different ways; that is, the formulas would be more or less different, would they not?

Dr. AUSTEN. The only appreciable difference would be that some are more concentrated and some a little less.

I may say, by the way, that there is one point which I do not think is very clearly understood. We talk about alum baking powders. What is used to-day in baking powders is not what is popularly known as alum. It used to be alum which had been calcined. They began

a few years ago to use the old potash alum. If you went to a drug store and asked for alum you would get that. Later on it was found that ammonia alum for certain reasons had a better effect.

In making alum baking powder the evolution of gas must be so regulated that it will go off slowly and in accordance with the temperature. If it goes off too quickly the bread swells up in a big bubble; if too slowly it will not rise. After a great deal of experimenting the manufacturers succeeded in getting the so-called alums to the point where the evolution of the gas was exactly the same as in the case of cream of tartar or any other baking powder, such as phosphate, so that the amount of gas given off is just the right amount for the temperature. That was the second stage.

The use of sulphate of alumina is increasing very largely. You are aware, of course, that alum is immensely used in the manufacture of paper—to the extent of thousands of tons. In alum the sulphate of alumina is the active principle. Sulphate of alumina is a very soluble substance, and it was found difficult to purify it and get it perfectly free from iron. The paper maker can not use the material if it has iron in it, as it will spot his paper. Sulphate of alumina combined with potash forms the old-fashioned alum. It is not very easily soluble and crystallizes easily, thus allowing it to be purified and separated from the more soluble and less easily crystallizing impurities.

As the progress of manufacturing went on it was found possible to make sulphate of alumina directly from bauxite (an alumina mineral), and by certain methods of manipulation in the manufacture to free it from iron. The paper maker instead of using the real alum now uses sulphate of alumina. In the manufacture of baking powder alum, in the proper sense of the word, is not used. Alum contains sulphate of alumina and sulphate of potash, or other alkali, with a certain amount of water. If it is heated there is obtained a mixture of sulphate of alumina and sulphate of an alkali, the sulphate of alumina being usually slightly basic. The "alum" used in baking powder generally contains a little more sulphate of soda than a true soda alum would contain, so we are not quite right when we say "alum" baking powder. If a paper maker orders alum, he gets sulphate of alumina; if a drug store orders it, it gets potash alum; if a baking-powder establishment orders alum, it gets c. t. s., or cream of tartar substitute, a calcined mixture of sulphate of alumina and sulphate of soda.

Senator HARRIS. I wish you would state whether all the manufacturers of what is called alum baking powder use a formula, or use certain chemicals which produce precisely the same chemical reaction.

Dr. AUSTEN. Very closely, sir, with the exception that some are stronger than others. There are only a few makers of this substance in the country. C. t. s. is made practically, I think, by three very large chemical manufacturers. They get formulas with, say, so much c. t. s., so much bicarbonate of soda, so much starch or flour. With phosphate they use so much alum, so much acid phosphate of lime, and so much bicarbonate of soda. All that the manufacturers do is to put it into the mixing machinery.

Of some of these powders one teaspoonful is used; of others, two. In general, the idea of an alum baking powder is economy. It can be sold very cheaply. In Georgia a baking powder, made by Morehouse & Co., of Savannah, is sold for 10 cents, of which one teaspoonful raises a quart of flour. An amount of high-grade cream of tartar to

give the same degree of gas efficiency would cost nearly \$2. The economic aspect is a very large one to the people. It would make a difference in the cost of living running up into the millions. I figured it out that it would make a difference in Georgia of over \$3,000,000 a year. That is the reason why this manufacture has grown up and has been so persistent in holding out despite the continual warfare waged against it by rival manufacturers of other kinds of baking powders.

Senator HARRIS. The letters "c. t. s." mean cream of tartar substitute?

Dr. AUSTEN. Yes, sir.

Senator HARRIS. It is a preparation which is chemically a form of alum?

Dr. AUSTEN. Yes, sir.

Senator HARRIS. And is used as a substitute for cream of tartar?

Dr. AUSTEN. Yes; and gauged to evolve gas with bicarbonate of soda at the same rate that cream of tartar would do under the same conditions of moisture and temperature.

Senator HARRIS. It seems to me there is another element of uncertainty in arriving at the physiological effects by experiment, because of the more or less intelligent or unintelligent preparation of the bread itself?

Dr. AUSTEN. Yes; but you may say that any food product prepared unintelligently is liable to produce disturbance.

Senator HARRIS. There is the difficulty in separating the effects of the articles used from the effects of the bread itself, owing to its being made improperly.

Dr. AUSTEN. Of course you must take the practical side of the matter. As a matter of fact the average bread throughout the country is pretty fairly made. You do get bad biscuits once in a while. Everyone knows what it is to get a new cook, but the average food product made in the household is pretty well made, because after all it is an easy matter. One or more teaspoonfuls of baking powder to a quart of flour are taken. If the bread is not right people will not eat it. Consequently you do not get much physiological effect at large from bad bread. The master of the house objects, and the cook is discharged. It is pretty hard to get people to eat badly prepared bread or any other food product.

Senator HARRIS. We do eat a great amount of bad food.

Dr. AUSTEN. Due to undercooking or overcooking; but we do not eat such a large amount of badly prepared bread. I think bread and cake and so on are fairly well made. Of course in an experiment of this kind, if we were to have imperfect formation of bread, the results from that would not be new. We would be able to trace them as results. They would be disturbances of quite a different nature.

The CHAIRMAN. Dr. Wiley, do you wish to ask any questions?

Dr. WILEY. No, sir.

STATEMENT OF ARTHUR T. SHAND.

The CHAIRMAN. I told you, Mr. Shand, that if you would present an affidavit sworn to I would consider it the same as if you or your people came before the committee.

Mr. SHAND. Yes; and gave testimony.

The CHAIRMAN. So far as concerns the owners and manufacturers of the products of Arthur Guinness Son & Co., Limited.

Mr. SHAND. That is what I understood, and I now present the statement:

UNITED STATES SENATE—SPECIAL COMMITTEE ON MANUFACTURES.

Statement of Arthur Guinness Son & Co., Limited, of St. James Gate, Dublin, for the consideration of the Special Committee on Manufactures appointed by the United States Senate, which statement is verified by the declaration of Christopher Digges La Touche, managing director of the company, hereto attached, and is respectfully submitted, pursuant to the subpæna issued by the said committee to Arthur T. Shand, of 42 Beaver street, New York, the American representative of the said Arthur Guinness Son & Co., Limited.

We would submit for the information of your committee the accompanying statement, and in doing so we have addressed ourselves more especially to the following questions:

1. Whether it is possible to brew for exportation stout which will remain sound and palatable for a prolonged period without the use of antiseptics although exposed to a wide range of temperatures?
2. Can stout be brewed from defective materials?

In answer to the first of these questions, viz, Is it possible to brew for exportation stout which will remain sound and palatable for a prolonged period without the use of antiseptics although exposed to a wide range of temperatures, we would unhesitatingly answer that it is, provided that such stout is brewed from sound materials, at a sufficiently high gravity, thoroughly fermented, and sufficiently hopped.

As to the second question, viz, Can stout be brewed from defective materials, we are of opinion that stout brewed from defective materials must suffer in flavor and stability.

In support of the answers which we have given to the foregoing questions we give for the information of your committee details of some special features of our manufacture, and the results obtained thereby. Pure beer is a liquor prepared by steeping malt with hot water, thereby effecting the chemical change of the constituents of malt into soluble products; the infusion thus produced is then boiled with hops and subsequently fermented with yeast either on the high or low system of fermentation.

The liquor resulting from this process consists of water, alcohol, extractive principles of hops, nitrogenous and mineral matters, and a considerable amount of carbohydrates derived from malt in an assimilable form.

The comparative excellence of beers depends on the quality of the materials, the purity and suitability of the water, the skill and cleanliness employed in their manufacture, the perfection of the machinery, and lastly the kind of yeast used for fermenting the extract of malt.

We are enabled to testify as to the correctness of the foregoing statement, as the result of accumulated experience in the brewing of Guinness's stout, which extends over a period of considerably more than a century.

The properties of Guinness stout are the result of strict conformity to the principles which we have hereinbefore laid down.

The only materials used in the manufacture of Guinness stout are malt, hops, and water, no foreign matter, even for the purpose of col-

oring the stout, being allowed to be introduced into the manufacture. Our stout brewed for exportation is manufactured with a larger percentage of hops than that brewed for the home market and to this is due to some extent its greater stability and agreeable flavor. The stout so brewed is submitted to a careful and prolonged process of maturing in large bulk vats at St. James Gate brewery, some of these vats containing as much as 80,000 gallons. The stout during the period of storage, which period varies from one to two years, matures slowly and steadily, acquiring the additional flavor and aroma, and this process of maturing also controls the ultimate condition of the stout in bulk and bottle.

In our opinion the effect produced by the natural maturing process could not be obtained by any artificial means, and although the process indicated represents a very large expense, yet the result, in our opinion, fully justifies the expenditure.

We have had cases in which Guinness stout supplied from the brewery has again reached our hands from America and Australia after a lapse of four years, and when examined has left nothing to be desired in the character and condition of the beer either as a tonic or a beverage.

So far as the materials used by us, viz., malt, hops, and water, are concerned, each form the subject in a separate department of the brewery of careful investigation and daily examination.

The malt used is all made from high-class barley, selected by expert buyers, and is the best that can be obtained for the purpose of stout brewing. The deliveries of malt at the brewery are checked both by experts and by chemical analysis, all malt being rejected which has, among others, any of the following defects:

1. Excess of moisture, which causes an undue formation of lactic acid in the stout.

2. Mold, produced by faulty working in the malt house, which causes unsoundness and disagreeable flavor.

3. Insufficient modification during the malting process.

4. Insufficient curing, resulting in rawness of flavor.

The unusually strict examination to which we submit our malt is due to our believing that a sound stout can not be brewed from defective malt.

The hops used represent the finest English and American growths; no hops in any way deteriorated are employed. In this connection it may be interesting to note that our use of American hops has largely increased of recent years, the quality of some years' growths being very fine.

The water used in our brewery is a pure water, free from contamination with sewage or decomposed animal matter. It is remarkably free from bacterial life. The composition of the water is constantly and regularly ascertained.

The yeast used to ferment the stout is our own yeast, produced by ourselves in the brewery. On this depends, to a great extent, the character of the fermentation and resulting product.

The high fermentation system is used.

The clarifying process is effected by means of isinglass.

Generally with reference to Guinness stout we may mention the following particulars:

1. The original gravity of the stout, i. e., the specific gravity of the extract of malt before it is fermented, is 1072 to 1074.

2. It is constant in its composition, the greatest care being taken to insure uniformity of production. This uniformity is checked both by the excise officials and by ourselves. When on the market the stout brewed for exportation contains, either in bulk or in bottle, about 6.1 per cent absolute alcohol by weight and 6 per cent solid matter.

3. As regards antiseptics, we would say at once that neither we nor our bottlers use any, considering same unnecessary if the stout is skillfully brewed of sound materials and with rigorous regard to cleanliness. We are opposed to the secret and uncontrolled use of antiseptics to foods and beverages. Such antiseptics are often drugs, and we believe that the bulk of the credited evidence on the physiological effects of common antiseptics tends to prove that their use is prejudicial to the consumer.

4. Guinness stout during the whole process of its manufacture is under the supervision of Government officials, and their returns will show the correctness of our statements, and that no substitutes of any kind for malt are used. We are, and always have been, opposed to their use when the prime object is to brew a stout of the highest quality.

Excise duty is charged daily on the gravity of the wort from which the beer is brewed. The charge is based on the barrel of 36 imperial gallons at a standard gravity of 1055, a deduction of 6 per cent being allowed for waste. The average payment of beer duty per day is about \$10,000.

Guinness stout for exportation being brewed at a gravity of 1073, a rebate is allowed to bottlers exporting to foreign countries, on the production of a guaranty by us, verified by the excise officials, that the stout supplied is of that gravity.

In conclusion, we have endeavored to show that, as a result of our experience, beer brewed under the conditions laid down by us will keep in sound and palatable condition for an unlimited period without the use of antiseptics; and we are satisfied that our stout, if brewed from materials in any way faulty, would not be a satisfactory or reliable article.

At the same time it will be seen that the converse would prove equally true, viz: That malt liquors which contain little or no alcohol due to fermentation, and little or no hop extract, would require the introduction of some preservative element to enable them to remain palatable and withstand severe atmospherical and climatic conditions.

CHRISTOPHER DIGGES LA TOUCHE,
Managing Director Arthur Guinness, Son & Co., Limited.

CONSULATE OF THE UNITED STATES OF AMERICA,
Dublin, Ireland.

Be it remembered, that on this 9th day of December, A. D. 1899, before me, Joshua Wilbour, consul of the United States for Dublin, Ireland, and the dependencies thereof, personally appeared Christopher Digges La Touche, the managing director of Arthur Guinness' Son & Co., Limited, Dublin, personally known to me to be the same individual described in and who executed the annexed instrument. He acknowledged to me that he executed the same of his own free act and deed and for the uses and purposes therein set forth.

In testimony whereof I have hereunto set my hand and affixed the

seal of this consulate at Dublin, Ireland this day and year last above written.

[SEAL.]

JOSHUA WILBOUR,
United States Consul.

COUNTY AND CITY OF DUBLIN, *to wit:*

I, Christopher Digges La Touche, aged 30 years and upward, managing director of Messrs. Arthur Guinness' Son & Co., Limited, do solemnly and sincerely declare as follows:

(1) I have read the statement hereto attached submitted by the said Arthur Guinness' Son & Co., Limited, for the consideration of the special committee on manufactures appointed by the United States Senate, and I say that the contents thereof are true to the best of my knowledge, information, and belief.

CHRISTOPHER DIGGES LA TOUCHE,
Managing Director Arthur Guinness, Son & Co., Limited.

The CHAIRMAN. Are there any suggestions that you wish to make? Do you want to be sworn as a witness?

Mr. SHAND. No, because I am not a practical man.

The CHAIRMAN. You are not a brewer?

Mr. SHAND. No, sir. Everything they would have said had they been here is embodied in the statement.

The CHAIRMAN. Very well.

Mr. SHAND. I know that the statement was prepared after consultation with the brewer and the analyst, and they could not tell you any more if they came here.

The CHAIRMAN. Where are these articles manufactured?

Mr. SHAND. In Dublin.

Dr. WILEY. You refer to stout?

Mr. SHAND. Yes, sir.

The CHAIRMAN. And they are imported into this country?

Mr. SHAND. Yes, sir.

The CHAIRMAN. How are they imported?

Mr. SHAND. In bulk in hogsheads for bottling purposes in this country, but by far the greater portion of it is bottled in Dublin, Liverpool, or London.

The CHAIRMAN. When you bottle it—

Mr. SHAND. We do not bottle it.

The CHAIRMAN. If genuine Guinness stout is bottled at all in this country it is bottled by your customers and not by yourself?

Mr. SHAND. Yes, sir. We have only one concern in the United States. That is Thomas McMullen & Co. We are most careful to whom we give it for bottling purposes. We issue labels, which are printed by ourselves, for exactly the quantity that we deliver to the customer. We insist on their using those labels.

The CHAIRMAN. For instance, without forging your label they could not bottle 1,000 cases if you sent over only 500 cases.

Mr. SHAND. No, sir.

The CHAIRMAN. They use your labels because they use your stout?

Mr. SHAND. Yes, sir; that is the reason; and we will not sell them our stout unless they agree (there is a regular form of agreement) that they will use our label, and that they will affix the label to each bottle they put up, and we will not sell to anyone who bottles any other black beer. It must be Guinness stout alone.

At 12 o'clock and 15 minutes p. m. the committee adjourned.

COMMITTEE ON MANUFACTURES,
UNITED STATES SENATE,
Washington, D. C., January 13, 1900.

The subcommittee met at 10 a. m.

TESTIMONY OF DR. C. PRUYN STRINGFIELD.

Dr. C. PRUYN STRINGFIELD, sworn and examined :

The CHAIRMAN. What is your profession?

Dr. STRINGFIELD. I am consulting physician at the Chicago Baptist Hospital.

The CHAIRMAN. I think that when you were examined before, you stated the positions that you had held, but I wanted to add something to the testimony you have already given, because of a question which has come up before our committee within the past few days. I have been requested to call some scientific gentlemen and ask them some questions in regard to the food product known as baking powder. I would like you to state for the benefit of the committee what your opinion is in regard to the two general classes of baking powders. But before putting that question specifically to you, I should like to have on the record something further as to the positions that you have held. In the first place, Doctor, please state from what school you were graduated.

Dr. STRINGFIELD. The medical department of the Northwestern University. I attended in fact at the Chicago Medical College, but it was controlled by the Northwestern University. I had a chair for five and a half years in that medical school.

The CHAIRMAN. What chair did you occupy?

Dr. STRINGFIELD. I was assistant to the chair of the principles and practice of surgery. But while thus an assistant I did all the surgical work, conducted the clinic, and performed all the operations.

The CHAIRMAN. And have you a speciality now?

Dr. STRINGFIELD. Yes; my speciality is diseases of the stomach or diseases of the digestive tract.

The CHAIRMAN. With what institution have you been connected?

Dr. STRINGFIELD. I have been connected with the Mercy Hospital; and have been connected with the health department of the city of Chicago. I have also been connected in a professional capacity with the militia. I am the physician of the Grand Pacific Hotel in Chicago; but my most important connection from a professional point of view is that with the Baptist Hospital, of which I am consulting physician.

The CHAIRMAN. Let me now ask you to give the committee the benefit of your opinion in regard to the two general classes of baking powder.

Dr. STRINGFIELD. You mean the alum and the tartrate baking powders?

The CHAIRMAN. Yes.

Dr. STRINGFIELD. It is known by everybody familiar with chemistry and with the digestive functions that alum is a positive irritant, and is poisonous; it is an irritant poison—that is the best way to state it. Do you wish me to continue, or will you propound questions?

The CHAIRMAN. I should like you to state your opinion fully.

Dr. STRINGFIELD. Alum is a double sulphate of aluminum and soda, aluminum being the acid and soda the base. Its composition is one of

the acid and two of the soda. Alum should never be used internally. It is used locally as an astringent, but not continuously. It is an irritant poison, cumulative in its effects. It first acts as an astringent and then an irritant, so that it may be termed an astringent irritant. It impairs nutrition, retards digestion both in the stomach and intestines, causing dyspepsia, indigestion, and constipation, with their resulting evils.

Alum also acts as a positive irritant to the kidneys, through which it is excreted. It undergoes a change in the stomach, forming a phosphate or hydrate of aluminum, and also liberates carbonic acid gas in the stomach. It interferes with the secretion of the gastric juices by its decomposition, forming hydrates or phosphates, and these are moderately soluble in the gastric juices.

In my opinion alum is one of the common causes of dyspepsia and indigestion.

My special field of practice has been diseases of the digestive tract, and from my observation I have concluded that the great majority of cases of difficulty with that tract might be traced to the white bread and the quick hot breads that are made with baking powder.

Alum is used commonly to whiten bread, by the bakers principally, to give it a better appearance; but its use daily and continuously is without question not alone harmful, but positively poisonous. It has been known to cause death. I do not mean to say that death was caused by eating bread made with alum; what I mean is that alum itself has been known to cause death.

The CHAIRMAN. I do not think of any further questions to propound to you. I did desire to have your opinion with reference to these baking powders in addition to the evidence you had already given.

Dr. STRINGFIELD. There should certainly be positive legislation on that matter, in the interest of the public health; not merely legislation, but national legislation. I understand that in England there has been such legislation passed.

The CHAIRMAN. I have been so informed, but do not know how true that is.

Dr. STRINGFIELD. I have been so informed, and if such legislation has not been enacted it ought to be, and it will be sooner or later.

The CHAIRMAN. The committee are much obliged to you for your attendance. I believe there is nothing further that I desire to ask.

The subcommittee adjourned until Wednesday, January 17, at 10 o'clock a. m.

COMMITTEE ON MANUFACTURES,
UNITED STATES SENATE,
Washington, D. C., January 17, 1900.

The committee met at 10 a. m.

Present: Senators Mason (chairman) and Foster.

TESTIMONY OF PROF. JOHN WILLIAM MALLET.

Prof. JOHN WILLIAM MALLET sworn and examined:

The CHAIRMAN. Please state your profession.

Professor MALLET. I am professor of chemistry in the University of Virginia.

The CHAIRMAN. You might state, if you please, for the purposes of the record, where you obtained your training.

Professor MALLET. Chiefly at the University of Göttingen, in Germany.

The CHAIRMAN. How long have you held the position which you now occupy?

Professor MALLET. I have occupied that position since 1868, with the exception of two sessions, when I lectured elsewhere.

The CHAIRMAN. Without stating all of the scientific societies with which you are or have been connected, you might, if you please, state some of those societies.

Professor MALLET. I am fellow of the Royal Society of London; member of the Chemical Society of this country (the American); member of the Chemical Society of Paris, France, and of the English and German societies (London and Berlin). Those are, perhaps, the most pertinent to be given in reply to your question.

The CHAIRMAN. In the course of your professional duties have you had occasion to take up the matter of food adulteration?

Professor MALLET. To a considerable extent.

The CHAIRMAN. By the resolution of the Senate, under which this committee are now operating, we are directed to ascertain, first, what foods are sold to the public that are deleterious to the public health, and second, what foods are sold that are adulterated or sophisticated, in a manner not necessarily deleterious to the public health but in fraud of the consumer. Taking first the first branch of the resolution: Has your course of study and your practical experience brought you in connection with any foods that you consider deleterious to the public health?

Professor MALLET. Yes; from time to time cases occur in which distinctly deleterious substances are added to food preparations. Still there has been a good deal of exaggeration on that subject. There are a great many cases that have been made subjects of newspaper comment for which there has been not so much foundation as the comments indicated; but there undoubtedly are such cases.

The CHAIRMAN. Will you be good enough to name some of those that you have had occasion to analyze, that have come within your knowledge?

Professor MALLET. The one to which your telegram refers has received from me more extended attention perhaps than any others, namely, the use of alum in baking powders. I published a paper on that subject and as your telegram indicated that, I brought a copy of it with me.

The CHAIRMAN. That question came up particularly in connection with the testimony of, I think, Dr. Austen; and it was at the request of someone who wished all sides of the question to be heard that I telegraphed to you, just as the gentlemen now present have come in order to testify as to their products. Therefore your attention was directed to that subject in the telegram. I should be very glad if you would give the committee the benefit of your opinion on that subject.

Professor MALLET. You have mentioned that these gentlemen here are representing particular products. You understand that I do not represent any manufacturer whatever.

The CHAIRMAN. I understand perfectly that you are here as a disinterested witness. You are not interested in the manufacture or sale of any baking powder, for instance?

Professor MALLET. No.

The CHAIRMAN. Nor in the wine that these other gentlemen present represent?

Professor MALLET. No.

The CHAIRMAN. Your position in the university and your studies and training, your experience and your work as a professional man have put you in a position to be called as an expert, and the committee are very glad to avail themselves of your opinion, and I desire to say that we are indebted to you for your attendance here and shall be very glad to have your opinion upon this matter of baking powders.

Professor MALLET. Perhaps it will be best for me to state in general terms what my opinion is.

It is pretty generally conceded, I think, that alum in itself is an unwholesome substance; in fact, text-books on medical jurisprudence, for instance, class it as a poison. It is not a virulent poison in the sense that arsenic or corrosive sublimate are poisons—that is, it is not fatal in small doses, but that it is unwholesome taken into the system is, I think, practically conceded by everybody.

The use of alum along with bicarbonate of soda in baking powders grew up in this country some twenty or twenty-five years ago and has become a very largely practiced industry, mainly in consequence of two facts: First, that the alum baking powders make very pretty looking bread; they produce the effect of lightening the bread, without interference with its color when properly manufactured; and, secondly, that it is a very cheap material. On the other hand as soon as its use became known there was very extended complaint made that alum, an injurious substance, was being introduced into food preparations.

The answer which the manufacturers gave to this complaint is that the alum does not remain as alum in the bread, that it acts on the bicarbonate of soda and is intended to act upon it, giving off carbonic acid gas, which lightens the bread or renders it porous, and leaves behind products of the decomposition of alum, of which the two principal substances are hydroxide of aluminum and phosphate of aluminum.

As to the latter I ought to say that the phosphate of aluminum is due to one of two causes—either the existence of phosphates in flour, which are always present in small amount and will produce a minute amount of phosphate of aluminum, or the addition of phosphate of calcium, which has been used to produce the same effect. Some 5 or 6 per cent or perhaps more is very commonly added to the alum baking powders and that leaves some aluminum present as phosphate.

The claim of the manufacturers was that these two substances, hydroxide of aluminum and phosphate of aluminum, and also sulphate of sodium, which is produced at the same time, are unobjectionable, although the alum, if it remained unchanged, would have been harmful.

The present state of our knowledge, it seems to me, is this: We have first to encounter in the use of alum in baking powder the danger of imperfect manufacture. If either the alum or the soda is not weighed out in proper proportion, an excess of alum being used, there will not be enough soda to decompose all the alum, and there will be some alum left in the bread after being made. That might seem to be a very trifling objection, because it is so easy to weigh a thing accurately, and I do not suppose there is much danger of that occurring on the part of the larger manufacturers; but the simplicity and cheapness of the manufacture is such that a multitude of alum baking powders are

being put upon the market, some of them made in a very small way, and by people practically altogether ignorant of chemistry.

I have had one or two instances fall under my own observation of people who can hardly be classed as manufacturers in the larger sense of the term who have taken up that manufacture in quite a small way, who have started a brand of their own, and in whose care, even as to weighing, I should not feel much confidence.

In the next place, assuming the weighing to be right, we have the risk of imperfect mixture. You may locally have an excess of alum in one part and an excess of soda in another, and in such case, if there were an imperfect mixture, you would have to encounter in the third place an imperfect mixture of the baking powder with the flour on the part of the cook.

If you assume that some parts of the baking powder contain an excess of alum, and those parts are not properly mixed with the flour, you would have in perhaps a single loaf more alum than belonged to the particular mixture. So that I do not think it can be altogether unworthy of consideration—the possibility that alum itself, admitted on all hands to be injurious, would remain in the bread.

Senator FOSTER. That is owing to the danger of the matters being improperly mixed?

Professor MALLET. Owing to either imperfect weighing, or imperfect mixing, or, in the third place, an imperfect mixture of the flour by the cook.

Disposing of that, the more important question a great deal is the one I referred to just now, namely, assuming that the powder is properly mixed, whether the substances that remain in the bread are or are not harmful. That is the one that I undertook to examine from a purely scientific point of view, and I published a paper on the subject in one of the London scientific journals. I will leave a copy of that with you.

Senator FOSTER. Is alum mixed with all baking powder?

Professor MALLET. No.

Senator FOSTER. With the Royal Baking Powder, for instance?

Professor MALLET. No, sir; that is made with cream of tartar.

Senator FOSTER. No alum at all?

Professor MALLET. No. There are four classes of baking powder in use in the United States. First, the cream of tartar powders, in which nothing but cream of tartar, bicarbonate of soda, and starch is used.

Senator FOSTER. That is the more expensive?

Professor MALLET. Yes. Starch is added, however, merely to keep it dry. In the second place, there are powders made with alum, bicarbonate of soda, and starch only. In the next place, there are some made with acid phosphate of calcium, bicarbonate of soda, and starch only; and, fourthly, some (and these most largely) made with alum, bicarbonate of soda, some calcium acid phosphate, and starch. They are more generally spoken of as cream of tartar powders straight; then there is the alum powder straight, and the phosphate powder straight, and the alum-phosphate powder.

My general conclusions from the experiments I made were these: I first experimented with baking powders containing alum, many different brands, to which water was added to ascertain whether any of the aluminum remained in soluble form. I found that there was a

small proportion of the aluminum in soluble form after the action. I then experimented with an artificial gastric juice—placing it under the conditions of digestion—a solution of dilute hydrochloric acid and pepsin. On the one hand I found that some of the aluminum hydroxide or phosphate passed into solution, and on the other hand some of the pepsin was coagulated.

I then experimented on myself, making some 24 or 25 experiments. Taking hydroxide of aluminum and phosphate of aluminum—taking the two substances into which the aluminum of the alum was converted—I found that whenever the dose was not less than, I think, 20 grains of the hydroxide of aluminum, there was distinct indications of indigestion—heaviness and all the common symptoms of indigestion. It seems to inhibit, as the physiologists say, or interfere with digestion.

Now, pursuing what I was saying a moment ago, the question as to the activity or inactivity of these two substances, the hydroxide of aluminum and phosphate of aluminum, is manifestly concerned with and involves the action not of water only, but of the gastric juice, because these are brought into contact with that when actual use is made of bread produced with alum baking powders. It is notoriously a fact that the gastric juice contains, as the two most active principles, hydrochloric acid on the one hand and pepsin or animal ferment on the other.

Now, hydrochloric acid, when brought into contact with either hydroxide of aluminum or phosphate of aluminum, will dissolve them, and therefore the claim originally made that the substances are inert because they are insoluble is not true when, instead of water, they are exposed to the action of gastric juice. They are not insoluble in gastric juice. On the contrary, they are dissolved. And what perhaps technically increases the force of the objection is that we must remember the presence of the sulphate of sodium, which is formed at the same time. If you have sulphate of sodium and chloride of aluminum together, sulphate of aluminum would be re-formed to some extent. In other words, you reconstitute the alum in the stomach—admitting that the alum might cease to be alum in the constitution of the bread, it is reconstituted by the action of the gastric juice. The conclusion that I have arrived at amounts to a belief in the unwholesomeness of alum baking powders habitually used.

As I have already stated in regard to matters of food adulteration, there has been much exaggeration. I do not think it is desirable in the matter of corrective legislation that the adulteration of anything should be exaggerated. Alum is spoken of by some of the newspapers of the day as a deadly poison. So far as that might be construed to mean a deadly poison in the same sense that corrosive sublimate or arsenic is so characterized, I do not believe in it, but on the other hand the use of alum is undoubtedly deleterious to health, especially to children or ladies, or persons of weak digestion, perhaps more than to men in robust health; I think that is undeniable.

The CHAIRMAN. What is the difference between alum and cream of tartar?

Professor MALLET. Cream of tartar is the bitartrate or acid tartrate of potassium obtained from grapes. It is obtained from crude tartar or argol, which is the crust formed in casks, and to some extent in bottles, in which wine is allowed to undergo the later stages of its fer-

mentation. The wine becomes less and less capable of holding the tartar in solution, and it forms in crusts. Some of it also is obtained from the spent yeast or lees or dregs generally of the wine vats. All that comes from the wine-producing countries—the southern countries. The Italian, I think, is now ranked as among the most important. Some little is obtained from the wine industry of this country—not a great deal. It is dissolved and recrystallized. It is obtained directly from the grape juice, and is nearly pure.

Alum is made, the greater part of it now, from a mineral called beauxite, which is a native hydroxide of aluminum. This is treated with sulphuric acid of a certain strength, not the strongest, and to that solution sulphate of sodium is added, and the whole is evaporated until it sets into a crystalline mass on cooling. It is put into temporary boxes, which are afterwards knocked to pieces, and the so-called soda alum is taken out.

The two substances are bought by the manufacturers of baking powders. I do not think any of them manufacture the materials for themselves. The manufacture of baking powder consists simply in their buying the materials and mixing them.

The CHAIRMAN. Do you consider the cream of tartar powders deleterious to health?

Professor MALLET. No, sir; I have never investigated it directly myself, but I have no reason to believe that it is unwholesome. The tartrates in passing through the stomach become changed into carbonates.

Senator FOSTER. So that the continuous using of them is not deleterious?

Professor MALLET. I do not know of any evidence of its being so. I can imagine a case in which a large amount of cream of tartar might be injurious by rendering the urine alkaline and causing precipitation of the earthy phosphates.

On the other hand, many people with a tendency to uric-acid deposition from the urine are benefited by such alkaline character being produced. The extensive use of carbonate of lithia water is based largely on the idea of its being thus beneficial.

The CHAIRMAN. Take the question of the use of preservatives in foods. Have you analyzed any foods that contained preservatives?

Professor MALLET. Yes; I have analyzed a good many specimens of food, but I have not examined the question of the wholesomeness or unwholesomeness of substances added as preservatives so minutely as I have the alum question.

I think some preservatives are undoubtedly dangerous, that being sufficiently evidenced by the investigations made abroad and the legislation based upon it. The prohibition of the use of boracic acid or salicylic acid, for instance, by the German and French Governments leads me to believe that there must be substantial evidence that they are unwholesome, and, indeed, from my knowledge of the bad effects of some of them, especially salicylic acid, I should be sorry myself to habitually use any appreciable quantity of it. Of course in all these questions of the injurious effect of the particular substances added to food you have to take into account two things—the inherent quality of the substance and the quantity in which it is used.

Recurring for a moment, merely for the sake of illustration, to the

matter of alum, I have devoted a good deal of attention to its use for the clarification of water. I have been, since August last, carrying on a series of experiments for the city of Richmond, Va., with regard to the clarification of water, the city water being turbid. I am to be in Richmond the day after to-morrow to report on that subject. I want, if possible, to get the city council to substitute salts of iron for salts of aluminum. Alum, even in a minute amount, in drinking water is objectionable, while salts of iron are not. In the first place, if any trace of iron remains in the water—iron is a necessary constituent of the blood, and there is no possible objection to a minute amount remaining in water if it should remain; and in the second place it is a great deal easier to detect than aluminum.

I mention that because the question is somewhat different from the matter of alum in baking powder on account of the very small quantity used—one or two grains (often but a fraction of a grain) to a gallon of water, which is intended to be all precipitated. Even if all of this remains in the water the amount is, of course, much less than in the baking powder, as two teaspoonfuls of baking powder are commonly used to a quart of flour.

If you take any substance and dilute it sufficiently you can render it less harmful. Arsenic diluted over and over again until there is not more than one part in hundreds of millions I do not suppose anybody would be appreciably affected by swallowing.

On the other hand, a great many substances not commonly counted as poisons are capable of producing very bad effects if used in quite large amounts. Common salt is not ranked as a poison and is a constituent of the body, but if you were to swallow 4 or 5 ounces of that at a time it would produce very bad effects. So that, as I have said, both quantity and quality are to be taken into account.

In regard to baking powder, I think we are in a position to say that no serious detriment is to be looked for in any one piece of bread, but, on the other hand, deleterious effects are to be looked for from the habitual use of the bread.

The question of alum in water turns on the same idea, but the amount is smaller, and it is a more delicate question as to whether anybody would be injured by it. I should myself hesitate to use water treated with alum in the proportion, perhaps, in which it is generally used, and I am about to recommend to the council that they avoid it.

Senator FOSTER. In these alum baking powders do the labels show what the ingredients are—what makes up the baking powder?

Professor MALLET. I have never seen one myself that did. I have heard it stated that some of them do, but I have also heard it asserted (I am not speaking now from my own knowledge, only from hearsay) that they do so only in States where the law compels them to do so.

The CHAIRMAN. We have had a great many sample boxes before the committee, marked with large letters "Cream of tartar baking powder," and in small letters the words "just as good as."

Professor MALLET. The fact that there is a popular prejudice against the use of alum is evident from the fact that, although for a quarter of a century alum baking powders have been on the market, and although they cost but about one-fourth as much as the cream of tartar powders, the fact that the cream of tartar powders continue to be sold at a fourfold price, and largely sold, is evidence that they are preferred.

The average price of the alum powder is 10 or 15 cents a pound; the price of the cream of tartar powder, so far as I know, varies from 45 to 50 cents. In the smaller places I think the prices may be set down as 15 and 50, respectively. In other places, where prices are more closely noticed, I suppose 10 cents and 40 cents.

The CHAIRMAN. What is salicylic acid?

Professor MALLET. It is now almost universally made from carbolic acid of coal tar. It was originally made from salicin, from the bark of the willow.

Senator FOSTER. Physicians prescribe it for rheumatism?

Professor MALLET. Yes, it is largely used for that and with great advantage. But it is distinctly a medicinal agent.

You referred, Mr. Chairman, to a class of preparations which ought to receive consideration in legislation, preparations in which there is no distinctly deleterious matter, but a fraud is committed.

The CHAIRMAN. Yes.

Professor MALLET. It has always seemed to me that in such cases the consumer, the purchaser, is entitled to know what he buys. There may be nothing unwholesome in the addition or substitution, but it constitutes a fraud unless known to the consumer. There has been an immense amount of discussion about oleomargarine. It is a good and wholesome food, and in some cases, as of long sea voyages, it is used preferably to butter, but still it should not be called butter, or sold as such.

There was an outcry some years ago about glucose made from starch. Glucose is harmless in itself and, in fact, ordinary cane sugar if taken into the stomach is converted into glucose—into two kinds of glucose—by the action of the digestive fluid. But if a man sells glucose as cane sugar molasses—

The CHAIRMAN. Or if he sells glucose for honey, or for maple sirup?

Professor MALLET. Yes; that is a fraud. There are a number of manufactured products that fall under that head.

The CHAIRMAN. You believe that it would be good ethics to say to a manufacturer that he must mark his goods for what they are?

Professor MALLET. Yes.

The CHAIRMAN. And not sell glucose for honey, or oleomargarine for butter?

Professor MALLET. Precisely.

The CHAIRMAN. And if he is selling filled cheese it ought to be so marked? Last year, on the recommendation of this committee, the Senate passed a bill known as the flour bill. We found that flour was adulterated not only by starch, one of the products of the glucose factory, but with *terra alba* (white earth), sometimes to as high an extent as 12 per cent.

Senator FOSTER. Is that possible?

The CHAIRMAN. Yes. (To Professor Mallet.) You think, Professor, that things ought to be sold for what they are, and ought to be properly marked?

Professor MALLET. It seems to me so. A man who buys flour expects to get ground wheat, and he is entitled to get what he means to buy and actually orders.

The following is the paper of Professor Mallet, referred to in his testimony:

EXPERIMENTS UPON ALUM BAKING POWDERS, AND THE EFFECTS UPON DIGESTION OF THE RESIDUES LEFT THEREFROM IN BREAD.

By Prof. J. W. MALLET, University of Virginia.

[Reprinted from the London Chemical News, Nos. 1515 and 1516.]

It has been almost universally conceded that alum itself, when added singly to bread or other food, is positively injurious to health, and that its use, even in the small proportion sometimes employed to improve the appearance of bread made from unsound or inferior flour, must be regarded as reprehensible. But since the extensive introduction in the United States of baking powders made with alum and bicarbonate of soda, there has been much dispute as to the harmlessness or harmfulness of the substances which are left in bread made with such powders after the mutual reaction of their constituents and the completion of the baking process.

It has been claimed by those who advocate the use of cheap baking powders made with alum as one of the ingredients that as soon as the mixture of alum (usually first deprived by heating of the whole or much the greater part of its water of crystallization—so-called “burnt alum”) and bicarbonate of soda is moistened, as in working it up with flour and water to form dough or “sponge,” the aluminum sulphate is decomposed, sodium sulphate being formed, with which there also remains sulphate of ammonium or potassium, as ammonia or potash alum has been used, and the aluminum assumes the form of aluminum hydroxide, insoluble in water, and therefore supposed to be inert and harmless in the stomach and alimentary canal. It has been noticed that the aluminum is also partly converted into phosphate in presence of the phosphates naturally occurring in flour, and this has been also taken to be insoluble and inert. It has been further claimed that at the temperature of the baking oven aluminum hydroxide is itself decomposed, water being given off, and the highly insoluble aluminum oxide, or alumnia, left behind, to be discharged from the intestines as might be so much clay or other harmless and indifferent matter.

On the other hand, it has been asserted by some of those who oppose the use of alum in baking powders that the decomposition is not, or may not be, complete, and in any case that, as all of the constituents of the alum remain in the bread, the action upon the human system must be essentially the same as if the alum itself remained intact.

In the discussion of the effects on health of the residual substances left in bread made with alum baking powders there has been a good deal of loose argument, based upon data which were either merely assumed as probable or were too imperfectly supported by actual experiment. In such experiments as have been hitherto recorded bearing directly on the question there are many points left in an indeterminate state and calling for further investigation in order to clear them up and admit of an impartial conclusion being reached. The following work was undertaken with a view to furnish some more exact and satisfactory evidence of the kind required for the purpose of reaching such a conclusion.

1. General nature of the baking powders examined.

Of these there were 27 samples, representing 17 different brands. It was thought desirable to examine, at least in some cases, several samples of the same brand, in order to form an idea of the degree of uniformity to be counted upon as presented by the product of the same manufacturer.

The samples were in unbroken original packages, as found in ordinary retail trade. A good deal of difficulty was experienced at first in procuring samples of some of the brands, until it was observed that not in the larger and better shops of the principal cities, but in smaller shops and more obscure streets and towns, were these to be met with, indicating sale chiefly among the poorer classes.

Nearly all of these powders contained as their acid ingredient a mixture of alum and acid phosphate of calcium ("superphosphate"). In but one case was alum alone found. The alum employed was, for the most part, made with ammonium, not potassium sulphate, although the latter salt was also met with either singly or mixed with the former.

All contained as the alkaline ingredient acid carbonate of sodium ("bicarbonate of soda"). All contained starch, or, in two or three instances, crude flour or starch imperfectly separated from gluten.

2. Amount of carbon dioxide (carbonic acid) gas given off on moistening each baking powder with water.

As the object of using a baking powder in making bread is to produce porosity by the liberation and expansion of gas bubbles uniformly distributed through the mass, the amount of gas set free from a given quantity of the powder by moistening it is obviously an important point to be determined.

This amount was found to be very variable on testing carefully under similar conditions the different samples examined. Reducing the volume of gas to the same standard temperature and pressure, and allowing for gas retained in solution by water at the temperature of each experiment, the smallest quantity obtained was 36.91 cubic inches from 1 avoirdupois ounce of baking powder. The average for all the samples was 66 cubic inches from the same weight of powder. The largest quantity obtained was 99.37 cubic inches. Hence, if the average result be taken as the standard of comparison, a departure from it of as much as 44 per cent in defect and 50 per cent in excess was observed.

In obtaining these results no account was taken of any ammonium carbonate, which is employed, when at all, only in quite small proportion; this would only assume the gaseous form under the influence of the heat in baking.

The variability observed appears to be partly due to variation in the proportion of starch or other indifferent matter used, partly to the variable character of the commercial bicarbonate of soda employed (containing a larger or smaller proportion of true bicarbonate), partly to greater or less purity of the other active ingredients, partly to greater or less care in the adjustment to each other in proper proportions of the acid ingredients and the soda, partly to want of due care to insure uniform mixture of the ingredients, but mainly to greater or less absorption of moisture from the air in keeping, different degrees

of care in drying the materials, and in putting up the powder in packages for sale, and no doubt difference in age of some of the samples.

3. Relation of the variable product of carbon dioxide gas to the amount of powder necessary to be used in making bread.

Aside from the bearing on the fitness for producing porosity in bread, and hence on the money value of a baking powder, of the amount of carbonic acid gas given off by a given quantity of the powder, there is to be considered the bearing upon health of the habitual use of more or less of the powder to produce the same effect in "raising" bread. The directions accompanying most of the brands call for two teaspoonfuls, or in some cases two or three teaspoonfuls, for each quart of flour; but it may be safely assumed that in actual practice the bread maker will take such a quantity as experience may show to be necessary to produce the desired "lightness," whether by varying the number of spoonfuls recommended, or by changing the extent of filling of the spoon, or by discarding this measure in favor of some other the use of which is guided by observation of the resulting bread. Hence the use of a poor baking powder, or one in poor condition, yielding but a small proportion of gas, will lead to the employment of a relatively larger quantity, and will cause a larger amount of residual matter to be left in the same quantity of bread, causing increased ill effect upon health if such residual matter be injurious at all.

This point is to be borne in mind in forming any estimate of the quantity of residue from a baking powder which any single consumer of bread made with it may have to encounter.

4. Nature of the ingredients in a solution obtained by treating the several baking powders with water, so far as excess of acid or alkali derived from the powder is concerned.

On acting with a definite excess of cold water upon each sample examined, and filtering off the solution after escape of gas has ceased, leaving on the filter the starch and insoluble mineral products of the chemical action which had taken place, the clear liquid was examined as to its reaction to test paper, and the excess of acid or alkali was carefully determined.

In nearly all cases the liquid was alkaline, and the excess of alkali present was found equivalent to an amount of bicarbonate of soda varying from 2.06 to 19.11 grains for each ounce avoirdupois of baking powder used.

In two cases the reaction was acid, and to an extent which, if the excess be counted as alum over and above that required to neutralize the soda present, would be equivalent in the one case to 0.86 grain, and in the other case to 3.14 grains of burnt ammonia alum (or to 1.58 grains and 5.78 grains of crystallized ammonia alum, respectively) per ounce of baking powder. In fact, these two baking powders, being made with alum and acid calcium phosphate, the acidity was in part due to excess of the latter salt, though a soluble compound of aluminum was also present.

These results indicate the degree of variation in the adjustment to one another of the acid ingredients and the bicarbonate of soda, more or less carelessness as to the purity, and therefore real chemical efficiency

of the two classes of material, especially, in all probability, as to the relative proportions of true bicarbonate of soda, of the neutral carbonate, and of moisture in the soda used, and more or less inaccuracy in the weighing out and want of uniformity in the mixing of the materials as taken.

5. *Examination of the watery solution from the several baking powders as to the presence therein of aluminum and calcium.*

It has been commonly claimed in defense of baking powders made with alum that, conceding this salt to be itself injurious, it is decomposed in acting upon the bicarbonate of soda, assuming the alkaline material to be used in sufficient amount, hydroxide (or hydrate) of aluminum being formed, and that the latter is quite insoluble, and hence inert physiologically, so that no harm can result from its presence in the digestive organs. It has usually also been assumed that the calcium of calcium acid phosphate is rendered insoluble by conversion into tribasic phosphate on reaction with a sufficient amount of bicarbonate of soda.

On examining, however, the solutions obtained by acting with water on the various baking powders examined, due care being taken to remove any silica, to decompose any phosphate present, and to fully identify the aluminum and calcium found, it appeared that these solutions in all cases (except a single brand, made with alum alone without phosphate, in which there was but a trace of calcium) contained both aluminum and calcium in relatively small quantity, it is true, but in some cases to an extent equivalent to as much as 4.19 grains of burnt or 7.72 grains of crystallized ammonia alum, and to as much as 3.15 grains of lime per ounce of baking powder. Hence it is not true that the aluminum and calcium are left in a condition wholly insoluble in water; at any rate, in the presence of the other residual material of the baking powder.

In the powders containing calcium acid phosphate along with alum, part of the lime is in solution as carbonate dissolved by excess of carbonic acid. In such of these phosphate and alum powders as had least excess of alkali (bicarbonate of soda), the whole, or nearly the whole of the phosphoric acid was left in the part of the residue insoluble in water.

6. *Presence of a little organic matter (soluble starch) in the watery solution obtained from the baking powders.*

The solution obtained by acting on the powders with excess of cold water gave a strongly marked violet tint with a weak solution of free iodine, due to the presence of a little soluble starch. No dextrine or glucose was found. The presence of organic matter, although in very small amount, may possibly aid in bringing a little aluminum, or calcium phosphate, or aluminum hydroxide, into solution.

7. *Existence of aluminum largely as phosphate in consequence of the use of calcium acid phosphate along with alum.*

It has been pretty generally assumed that from alum baking powders the aluminum is left mainly as hydroxide (hydrate) in the bread, though attention has been drawn to the fact that some aluminum

phosphate may be expected to be formed from the phosphates of the flour itself. The quantity of aluminum phosphate so produced would probably be small. But, so far as the samples now reported on may be taken to represent the usual character of the alum baking powders at present in the market, it will have been seen that nearly all of them are made with both alum and calcium acid phosphate, and in the reaction of these two ingredients on each other we have a source of the much more abundant production of aluminum phosphate. In fact, in all the powders of this mixed character examined, nearly the whole of the aluminum was present as phosphate after treatment of the powder with water. Not quite the whole, however, as in two or three cases aluminum was detectable in the watery solution, while the phosphoric acid was left altogether in the insoluble residue. Of course, in such baking powders as are made with alum alone (no phosphate), the aluminum is left mainly as hydroxide.

8. *Presence of iron in small but varying amount in the baking powders examined.*

Although the quantity of iron in any of the samples examined must have been quite small, and no special attention was given to its determination, it was incidentally observed that this impurity varied very notably from one sample to another. This seems to indicate very different degrees of pains taken by different manufacturers to procure and use pure materials.

9. *Determination of the temperature to which the interior of bread is subjected in the process of baking.*

As aluminum hydroxide and aluminum phosphate are heated they give off water, and in consequence of this loss of water they become less soluble in acids, the anhydrous aluminum oxide (or alumina) being practically altogether insoluble in diluted or even pretty strong acids, while the anhydrous phosphate can be dissolved by them only slowly and with difficulty. When, therefore, we come to consider the solubility or insolubility of the residues left in bread from alum baking powders, not in water, but in the digestive fluids, especially in the acid gastric juice, it is important to know in what condition of hydration these residues are left in the bread, i. e., how far water has already been driven off and insolubility produced, and as a first step we need to know to what temperature the interior of the bread has been exposed in the oven during baking.

There is ample information to be found as to the usual or desirable temperature of the oven, but I have found no results of direct experiments on the temperature attained by the interior portions of the bread itself. It is remarked by some writers that, as there is much water still left in the bread when the baking is complete, the temperature of the inside of a loaf can not be expected to much, if at all, exceed the boiling point of water under common atmospheric pressure. But it seemed desirable to make some direct observations on this point, and this has now been done, the temperature of the oven, and of the interior of the bread while baking, and up to the time of withdrawal, having been noted, first, for a large public baking oven of brick, 12 feet by 14 feet, heated by a coke fire; second, for a smaller brick

oven in family use, and third, for the ovens of ordinary cast-iron cooking stoves, burning wood and coal, respectively. The results were substantially uniform. The temperature of the oven atmosphere varied from 472° to 496° F., while the maximum temperature shown by the registering thermometer with its bulb in the center of a larger or smaller loaf of bread, ranged from 197° to 212° F., never exceeding the latter point. In the case of the lowest temperature noted the bread as taken out of the oven was not quite sufficiently baked through, retaining rather more than a proper amount of moisture in the center of the loaf. Hence it may fairly be concluded, as the result of direct experiment, that the aluminum hydroxide and hydrated aluminum phosphate left in bread from alum baking powders are never exposed in baking to a temperature higher than 212° F.

10. Determination of the condition of hydration of aluminum hydroxide and hydrated aluminum phosphate after drying at 212° F.

These two substances were prepared in a pure state by precipitation, carefully washed, and allowed, in the first instance, to become dry at the common temperature of the atmosphere, covering them lightly to exclude dust. A portion of each contained in a small "boat" was then exposed in a wide tube, maintained at or close to 212° F. by an outside bath of water kept boiling, to a slow current of air nearly saturated with moisture at the same temperature, so as to place the material experimented on as nearly as possible in the same condition as if it were inclosed in a mass of bread undergoing the process of baking. This state of things was maintained for an hour and a half—a time considerably longer than that usually occupied in baking. The boat was withdrawn from the tube and accurately weighed, then heated gradually to bright redness, cooled, and weighed a second time. The difference between the results of the two weighings gave the amount of water removable from the material taken, as in the condition in which it would exist in baked bread. The results were as follows: Aluminum hydroxide as taken gave off 39.11 per cent water; aluminum phosphate as taken gave off 31.65 per cent water.

These figures correspond to about one molecule of surplus water for each three or four molecules of the normal aluminum hydroxide ($\text{Al}(\text{HO})_3$), and a little over three molecules of water for each molecule of normal aluminum phosphate (AlPO_4).

11. Experiments upon the influence on digestion of moderate doses of aluminum hydroxide and aluminum phosphate swallowed shortly before or along with food.

Having been interested by the results of a few experiments made in my own person a year or two ago on the apparent interference with digestion of these substances, I have tried a large number of such experiments under more carefully noted conditions and with definite quantities of the materials used, in order to test directly the physiological effect of the residues from alum baking powders, so far as this can be determined by their action in the case of a single person.

The experiments were made with a carefully prepared stock of the pure hydroxide and phosphate of aluminum, dried at 212° F. in the

way and to the extent described above (10). A weighed quantity of one or the other was swallowed either before—generally about ten minutes or a quarter of an hour before—a regular meal (using only a little water with the powder) or along with the food of an ordinary meal, and the effect, if any, upon the course of digestion noted and recorded. The experiments were made with intervals of three or four days between them; the food taken was of various kinds, but always simple and wholesome, and not likely of itself to produce disturbance of digestion; there was no preexisting derangement of the digestive functions when any experiment was undertaken; as much care as possible was taken to avoid any mere fancying of expected symptoms, and to state with moderation what was actually experienced. The results of all the experiments made were recorded, and the record was preserved in the words which seemed at the time most accurately to express the sensations observed.

While on two or three occasions, particularly with the smallest doses used, there was no clearly observable effect, the general tenor of the experiments seemed to establish beyond doubt on my part the fact that the ingestion of the aluminum compounds used produced an inhibitory effect on gastric digestion, while in some cases, particularly with the larger doses, and on the whole rather with the hydroxide than the phosphate for equal weights of the two, the interference with the course of digestion was very notable. There was no gastric pain, nor were there any other symptoms of gastric or intestinal irritation, but simply the well-known oppressive sensations of indigestion properly so called, lasting for a longer or shorter time, but generally for at least two or three hours after the taking of food.

The quantity of aluminum hydroxide swallowed in each experiment varied from 10 to 50 grains, the average for all the experiments being about 28 grains. The quantity of aluminum phosphate used ranged from 10 to 100 grains, the average being 45 grains. These doses were intentionally made larger than the quantities of the aluminum compounds in question derivable from such an amount of bread as would usually be eaten at a time if alum baking powder in anything like usual proportion had been employed in making it. The object was to ascertain with what doses distinct effects were noticeable, and this seemed to be generally the case with any dose not less than 20 grains of the hydroxide or with not less than 30 or 40 grains of the phosphate. It may, of course, be reasonably supposed that a considerably less quantity than would be necessary to produce decided discomfort when once administered might prove objectionable and injurious if habitually taken as a part of the bread of each daily meal. With the proportion of alum in most of the baking powders in use, with the allowance of two teaspoonfuls (counted as about 200 grains, though as much as 250 grains was found to be sometimes measured by a cook) of powder to a quart of flour, and assuming 35 or 40 per cent of water in baked bread, a pound of bread would contain about 13 or 14 grains of aluminum hydroxide if alum alone were used in making the powder, or about 20 or 21 grains of aluminum phosphate if alum and calcium acid phosphate were used together and all the aluminum were left in the bread as phosphate—these weights being taken for the substances assumed in the condition of hydration shown by the experiments recorded in preceding paragraphs.

12. Laboratory experiments on the effect of treating a liquid having the general composition of gastric juice with aluminum hydroxide and phosphate.

Some light seems to be thrown on the nature of the interference with digestion of these aluminum compounds by a few experiments made with an artificial gastric juice, prepared by dissolving 2.5 parts of (real) hydrochloric acid and 3 parts of a pretty easily soluble "pepsin" in water enough to produce 1,000 parts of the liquid.

A weighed quantity (about 50 grains) of either aluminum hydroxide or aluminum phosphate, carefully prepared and dried at 212° F., as described above (10), was added to a quantity of this liquid containing somewhat more hydrochloric acid than would suffice for complete solution, and the mixture allowed to stand, with occasional shaking, in a stoppered glass flask at about the temperature of the human body (98° or 99° F.) for a period which might be taken to represent something like the term of gastric digestion (two or two and one-half hours). The liquid was then filtered and a definite fraction of it evaporated to dryness at a low temperature over a water bath, and the residue dried at 212° F. and weighed. This residue was afterwards heated to redness in the air until all water was expelled and all organic matter burned off, and a second weighing made. In like manner the undissolved matter left upon the filter was dried at 212°, weighed, heated to redness in the air, and again weighed. A definite portion of the original liquid (artificial gastric juice) which had not been treated with either of the aluminum compounds was also, for the purpose of comparison, evaporated to dryness, the residue dried at 212°, weighed, burned, and weighed again. And, finally, weighed portions of the particular lots of aluminum hydroxide and aluminum phosphate employed were treated in the same way, and the loss of weight at 212°, and after heating to redness, ascertained.

From the data thus obtained it appeared that in each case a part of the aluminum was dissolved by the feebly acid liquid, while on the other hand a part of the organic matter used as pepsin was rendered insoluble and left with the undissolved portion of the aluminum compound present. When aluminum hydroxide was used from 47.3 to 61.8 per cent of it was dissolved, from 5.6 to 14.5 per cent of the pepsin being at the same time precipitated or thrown down from the solution. When aluminum phosphate was used the proportion of it taken up by the liquid ranged from 38.2 to 49.1 per cent and from 25.8 to 32.9 per cent of the pepsin was rendered insoluble. These figures represent but approximate quantitative results for the organic matter precipitated, as it was found extremely difficult to secure equal drying of the materials weighed, and moreover in the case of the aluminum hydroxide, added to the artificial gastric juice, a turbid gelatinous liquid was produced which it was impossible to filter to a state of perfect clearness. It was shown, however, distinctly that there was a double effect on the liquid treated, both the principal constituents of natural gastric juice being influenced; the hydrochloric acid was in part charged with the aluminum used, taken up in soluble form, and there was simultaneous removal from solution of the organic matter represented by the digestive ferment pepsin. This double effect may fairly be taken to indicate impairment of digestive efficacy of the natural gastric juice if exposed to similar treatment.

13. Probable similar relation of the aluminum compounds experimented on to the soluble organic matter of food as to that of the gastric juice.

Although I have not as yet made any direct experiments on this point, it seems highly probable that the second of the two effects above noticed, namely, the partial precipitation in insoluble form of some of the organic matter of a liquid having the general composition of gastric juice, would be brought about also if soluble albumenoid and other forms of organic matter of food were similarly treated, the aluminum hydroxide or phosphate apparently entering into a sort of more or less loosely united compound with such organic matter, somewhat as is the case when, in dyeing, coloring substances of organic origin are fixed by aluminum mordants. If so, there would be apparent a further explanation of the impairment of digestion of the aluminum compounds in question, a part of the food, already in soluble form, being rendered insoluble on the one hand, while on the other, the integrity of at least one of the most important digestive fluids of the body being interfered with, the power of dealing with the portion of the food requiring solution would be reduced.

14. General summary of the conclusions reached.

The main points which seem to be established by the experiments under discussion are, briefly stated, the following:

(a) The greater part of the alum baking powders in the American market are made with alum, the acid phosphate of calcium, bicarbonate of sodium, and starch.

(b) These powders, as found in retail trade, give off very different proportions of carbonic-acid gas, and therefore require to be used in different proportion with the same quantity of flour, some of the inferior powders in largely increased amount to produce the requisite porosity in bread.

(c) In these powders there is generally present an excess of the alkaline ingredient, but this excess varies in amount, and there is sometimes found on the contrary an excess of acid material.

(d) On moistening with water, these powders, even when containing an excess of alkaline material, yield small quantities of aluminum and calcium in a soluble condition.

(e) As a consequence of the common employment of calcium acid phosphate along with alum in the manufacture of baking powders, these, after use in bread making, leave at any rate most of their aluminum in the form of phosphate. When alum alone is used, the phosphate is replaced by hydroxide.

(f) The temperature to which the interior of bread is exposed in baking does not exceed 212° F.

(g) At the temperature of 212° F. neither the "water of combination" of aluminum hydroxide nor the whole of the associated water of either this or the phosphate is removed in baking bread containing these substances as residues from baking powder.

(h) In doses not very greatly exceeding such quantities as may be derived from bread as commonly used, aluminum hydroxide and phosphate produce, or produced in experiments upon myself, an inhibitory effect upon gastric digestion.

(i) This effect is probably a consequence of the fact that a part of the aluminum unites with the acid of the gastric juice and is taken up into solution, while at the same time the remainder of the aluminum hydroxide or phosphate throws down in insoluble form the organic substance constituting the peptic ferment.

(k) Partial precipitation in insoluble form of some of the organic matter of food may probably also be brought about by the presence of the aluminum compounds in question.

(l) From the general nature of the results obtained the conclusion may fairly be deduced that not only alum itself, but the residues which its use in baking powder leaves in bread, can not be viewed as harmless, but must be ranked as objectionable, and should be avoided when the object aimed at is the production of wholesome bread.

APPENDIX.

EXPERIMENTAL RESULTS IN DETAIL.

TABLE I.—*General character of samples examined.*

Brand.	Size and kind of package.	Nature of acid ingredients.
Davis's	1-pound tin can.....	Alum and calcium acid phosphate.
Do.....	½-pound tin can.....	Do.
Sunny South.....	1-pound tin can.....	Do.
Kenton.....	do.....	Do.
Do.....	do.....	Do.
State.....	do.....	Do.
Silver King.....	do.....	Do.
Do.....	do.....	Do.
Davis's O. K.....	½-pound tin can.....	Do.
Do.....	do.....	Do.
Patapsco.....	Loose (sold in bulk).....	Do.
Do.....	do.....	Do.
Do.....	do.....	Do.
Baker's.....	3-ounce tin can.....	Do.
Lion.....	2-ounce tin can.....	Do.
Do.....	½-pound tin can.....	Do.
Dixon's.....	½-pound paper, tin-foil ends.....	Do.
Haynor's Superlative.....	½-pound glass bottle.....	Do.
Do.....	½-pound tin can.....	Potassium alum and calcium acid phosphate.
Sanford's.....	3-ounce tin can.....	Alum and calcium acid phosphate.
Silver Star.....	½-pound tin can.....	Do.
One Spoon.....	do.....	Alum alone.
Forest City.....	do.....	Alum and calcium acid phosphate.
Great American.....	½-pound tin can.....	Do.
Do.....	do.....	Do.
Dry Yeast (Davis's).....	1-pound tin can.....	Do.

In the above table, alum was wholly or partially ammonium, unless otherwise specified.

TABLE II.—Amount of carbon dioxide (carbonic acid) gas, measured at 60° F. and 30 inches pressure, evolved on contact with excess of water.

Brand.	Size and kind of package.	Volume of gas per ounce avoirdupois of baking powder.
Davis's	1-pound tin can	Cub. inches.
Do	½-pound tin can	57.19
Sunny South	1-pound tin can	78.86
Kenton	do	75.08
Do	do	81.89
State	do	77.32
Silver King	do	65.56
Do	do	67.36
Davis's O. K.	½-pound tin can	80.27
Do	do	62.43
Patapsco	Loose (much caked)	65.19
Do	do	41.28
Do	Loose (caked)	65.27
Baker's	3-ounce tin can	52.41
Lion	2-ounce tin can	57.38
Do	½-pound tin can	58.04
Dixon's	1-pound paper (caked)	84.70
Haynor's Superlative	1-pound glass bottle	67.35
Do	½-pound tin can	36.91
Sanford's	3-ounce tin can	69.37
Silver Star	½-pound tin can	51.36
One Spoon	½-pound tin can	59.90
Forest City	do	64.64
Great American	do	99.37
Do	do	64.11
Dry Yeast (Davis's)	1-pound tin can	58.06
		69.25
		71.54

TABLE III.—Excess of acid or alkali in watery solution obtained on treating baking powders with excess of water.

Brand.	Nature of package.	Bicarbonate of soda equivalent to alkali found in excess, for 1 ounce avoirdupois of powder.	Alum equivalent to acid found in excess, for 1 ounce avoirdupois of powder.
Davis's	1-pound tin can	Grains.	
Do	½-pound tin can	8.88	
Sunny South	1-pound tin can	18.96	
Kenton	do	13.47	
Do	do	15.19	
State	do	9.45	
Silver King	do	11.80	
Do	do	11.98	
Davis's O. K.	½-pound tin can	12.26	
Do	do	14.04	
Patapsco	Loose	6.91	
Do	do	2.06	
Do	do	9.37	
Do	do		3.14 grains burnt alum, or 5.78 grains crystallized alum.
Baker's	3-ounce tin can	12.05	
Lion	2-ounce tin can	7.57	
Do	½-pound tin can	9.58	
Dixon's	½-pound paper	14.77	
Haynor's Superlative	½-pound glass bottle	0.86 grain burnt alum, or 1.58 grains crystallized alum.	
Do	½-pound tin can	19.11	
Sanford's	3-ounce tin can	17.05	
Silver Star	½-pound tin can	4.26	
One Spoon	½-pound tin can	9.85	
Forest City	do	8.82	
Great American	½-pound tin can	11.32	
Do	do	14.55	
Dry Yeast (Davis's)	1-pound tin can	10.18	
		18.23	

TABLE IV.—*Amounts of aluminum and calcium found in watery solution obtained on treating some of the baking powders with excess of water.*

Brand.	Nature of package.	Alumi- num in soluble form from 1 ounce avoirdupois of powder.	Equivalent to—		Calcium in soluble form from 1 ounce avoirdupois of powder.	Equiva- lent to lime.
			Burnt ammonia alum.	Crystallized ammonia alum.		
Davis's	1-pound tin can.....	Grains. 0.32	Grains. 2.92	Grains. 5.37	Grains. 1.59	Grains. 2.23
Kenton.....	do.....	.19	1.73	3.19	1.46	2.04
Silver King.....	do.....	.37	3.37	6.21	2.25	3.15
Davis's O. K.....	½-pound tin can.....	.33	3.01	5.54	1.33	1.86
Patapsco	Loose .....	.29	2.64	4.86	1.56	2.18
Lion.....	½-pound tin can.....	.20	1.82	3.36	.68	.95
Silver Star.....	½-pound tin can.....	.25	2.28	4.19	1.04	1.46
One Spoon	do.....	.46	4.19	7.72	Trace.	Trace.
Great American	½-pound tin can.....	.31	2.84	5.20	1.34	1.88

TABLE V.—*Results from swallowing aluminum hydroxide and aluminum phosphate.*

Date.	Substance tried.	Dose.	Time of taking.	Apparent effect.
1888.		Grains.		
July 2	Aluminum hydroxide.	20	Before breakfast.	Feeling of discomfort and oppression for some time after eating.
July 5	Aluminum phosphate.	20	do	Same, not so strongly marked.
July 9	Aluminum hydroxide.	40	With breakfast ..	Same, very distinctly observable.
July 13	do	40	do	Same, about to same extent apparently, perhaps rather more marked.
July 17	Aluminum phosphate.	40	Before dinner ..	Uncomfortable feeling, but not lasting more than half an hour.
July 20	Aluminum hydroxide.	30	With dinner ..	Well-marked indigestion.
July 24	Aluminum phosphate.	50	Before dinner ..	Moderate discomfort.
July 27	do	50	do	Same, less pronounced.
July 30	do	60	do	Decided discomfort for three hours after the meal.
Aug. 3	Aluminum hydroxide.	10	do	Slight feeling of oppression.
Aug. 6	Aluminum phosphate.	10	do	No perceptible effect.
Aug. 10	Aluminum hydroxide.	10	With breakfast ..	No effect observable with certainty.
Aug. 13	do	25	Before dinner ..	Moderate degree of discomfort.
Aug. 16	do	50	do	Distinct fit of indigestion, lasting until night.
Aug. 20	Aluminum phosphate.	20	With dinner ..	No effect observable with certainty.
Aug. 23	do	40	Before breakfast ..	Slight oppression.
Aug. 28	Aluminum hydroxide.	20	Before dinner ..	Decided oppression and flatulence.
Aug. 31	do	15	do	Not much effect, but noticeable.
Sept. 3	Aluminum phosphate.	100	Before breakfast.	Marked discomfort and impairment of digestion.
Sept. 6	do	75	Before dinner ..	Do.
Sept. 10	Aluminum hydroxide.	50	With dinner ..	Distinct feeling of indigestion for several hours.
Sept. 13	Aluminum phosphate.	30	With breakfast ..	Slight discomfort.
Sept. 17	Aluminum hydroxide.	30	do	Clearly observable sense of oppression from indigestion.

TABLE VI.—*Action of aluminum hydroxide and aluminum phosphate on artificial gastric juice.*

Substance used.	Percentage dissolved.	Percentage of organic matter rendered insoluble.
Aluminum hydroxide	54.1	9.3
Do	61.8	5.6
Do	47.3	14.5
Aluminum phosphate	49.1	28.1
Do	38.2	32.9
Do	45.7	25.8

TESTIMONY OF BENJAMIN RIPEN.

BENJAMIN RIPEN, sworn and examined:

The CHAIRMAN. What is your business?

Mr. RIPEN. Champagne making and selling.

The CHAIRMAN. Where is your place of business?

Mr. RIPEN. Ripen & Co., 152 Church street, New York.

The CHAIRMAN. How do you make your champagne? We do not wish to inquire into any trade secrets which you do not wish to make public. That is not the object of the committee. We ask these questions directly, and if there is any part of the process that will involve your exposing any trade secrets to your competitors here or elsewhere we do not call for that.

I will state to you preliminarily, in order that you may have it before you, that the statement has been made before this committee that the trade meaning of the word "champagne" is "a wine fermented in the bottle," and that any wine sold that is not fermented in the bottle ought to be marked accordingly.

Senator FOSTER. Ought to be so labeled.

The CHAIRMAN. Ought to be so labeled. When I ask you, therefore, how you make your champagne you will understand that you are not compelled to state any of your trade secrets, only so far as you may wish to do so.

Mr. RIPEN. I have a letter, Mr. Chairman, which is briefly worded, which I intended to send to you before I knew that I was coming here, and if you will permit me I will first read from that.

The CHAIRMAN. We shall be glad to hear it.

Mr. RIPEN. This letter states: "One of the bills before the Committee on Manufactures provides that effervescent wines made in this country in any other way than by fermentation in the bottle shall have printed across the label 'Carbonated champagne.'

"Originally the word 'champagne' designated wine from the province of Champagne, in France, whether effervescent or still; and for more than fifty years no such wine has been marketed in this country. General usage has given the name 'champagne' to all effervescent wines, regardless of the place where or the manner in which made; and to-day this definition is not only unanimous with the trade and the public, but is acknowledged in every modern dictionary and encyclopedia.

"From a health standpoint chemists and physicians indorse champagne made by the modern process, and declare it far purer than that made in the old and crude way.

"The effect of this bill would be to alter and restrict the accepted meaning of a word. The only motive that actuates the small clique of high-priced wine makers who expect to derive benefit from the passage of this bill is a desire to stifle competition by unfairly restraining trade in the so-called American champagne. We would be pleased, if desired, to enter more fully into the details of this subject."

That is what is stated in the letter. I shall be glad to answer any questions which the committee may see fit to ask me.

I will state, in the first place, that we buy our wine from a certain district in California—a wine that is called a Hillside of "Riesling." It is not less than 3 years old. That is the age at which wine is sup-

posed to be perfectly healthful to drink. It is guaranteed to us to be pure, containing no outside ingredients.

Senator FOSTER. How do you know that it is pure, beyond having it "guaranteed" to you?

Mr. RIPEN. I will tell you how we know that. We formerly had the wine examined, and when we want a batch of wine now we go to the party from whom we bought it and state that we want that same wine, with their guaranty that it is pure, the same as the previous shipments. We are compelled to take their word for it.

Senator FOSTER. That is shipped in casks, is it?

Mr. RIPEN. Yes.

Senator FOSTER. What effect has the air on it?

Mr. RIPEN. White wine would eventually come into contact with the air and would become sour, but this is hermetically sealed. When it comes into our place we work it over for probably six months. I do not think our wine is sent out from our place until it has been in the place for six months. In that period of six months we run it through a clarifying process which is best known to us, and we make it into champagne by the addition of gas.

The CHAIRMAN. In that clarifying process you do not use any deleterious substance?

Mr. RIPEN. No; no chemicals whatsoever.

The CHAIRMAN. Or preservatives?

Mr. RIPEN. No.

The CHAIRMAN. No salicylic acid, or anything like that?

Mr. RIPEN. No, sir; no chemicals whatsoever, as I have said.

It came to my notice, personally, that some of the other champagne makers came before your committee, and one of them has printed some questions and answers which it is presumed were asked and answered before the committee, and those questions and answers so printed were sent out to customers and to the trade in general [exhibiting a pamphlet].

We use a method of our own in carbonating our wine—carbonating it by a gas which is represented to us, and guaranteed to us, to be 99½ per cent pure. When that champagne is ready it is allowed to rest a while, to see whether any action takes place in it. After letting it rest for about a month we ship it out, and that champagne is then purer than any made anywhere in the world. I say here that it is purer than a natural fermented wine or a wine fermented in the bottle. Our wine is clean and pure when we get it; it is "aged." Then we use a gas which is absolutely pure—as pure as it can be. We have brought the chemist along who is connected with the place where the gas is made. Champagne which is fermented is made from a new wine.

The CHAIRMAN. It ferments in the bottle?

Mr. RIPEN. Yes; but the gas generated by the fermentation of the wine is carbonic-acid gas, the same as we put in the wine. Carbonic-acid gas (CO_2) would be the same whether generated in the bottle or otherwise; it is carbonic-acid gas; but the carbonic-acid gas which we use is 99½ per cent pure—as pure as it can be obtained commercially, while the carbonic-acid gas if drawn from the champagne bottle (if fermented in the bottle) would, in my opinion, be found to be only 90 per cent, or, as chemists say, 95 per cent, pure. That 95 per cent contains ethers and injurious gases which are deleterious to the system; and for that reason I claim that the wine which we make is purer and better than any naturally fermented wine could be.

As I have said, the public all through the country recognize as champagne an effervescent wine. The trade recognizes it to be an effervescent wine and all encyclopedias and dictionaries give the meaning of champagne as an effervescent wine, whether carbonated or fermented in the bottle.

The CHAIRMAN. Have you got the definitions copied out?

Mr. RIPEN. I have not got them copied out, but I have read them over.

The CHAIRMAN. I wish you would have those definitions copied and sent to me.

Mr. RIPEN. I will do so with pleasure.

The CHAIRMAN. The makers of champagne fermented in the bottle made the point very strongly that the trade considered the word "champagne" to mean "wine that is fermented in the bottle."

Mr. RIPEN. There are conflicting statements as to that. Mr. Werner, who is here, has a letter from good authority which bears upon the subject, and which he will probably read. The definitions I referred to are those of the recent dictionaries, such as Funk & Wagnall's and the last edition of the Encyclopedia Britannica.

Mr. AUGUSTUS C. WERNER, Jr. I have here a letter from Charles McK. Loeser's Sons, editors of Bonfort's Wine and Spirit Circular, relating to the meaning of the word "Champagne." It was written with reference to some statements made by the American Wine Manufacturers, who were before this committee.

The letter is as follows:

[Bonfort's Wine and Spirit Circular.]

OFFICE CHARLES MCK. LÆSER'S SONS,
New York, December 20, 1899.

DEAR SIR: In reply to your letter of the 18th instant we beg to say that the word "champagne" is a term used to designate wines grown in the old province of Champagne, in France, and properly used to designate only those wines.

The French courts have taken the matter under consideration in so far as to prohibit the manufacturers of sparkling wines in any other province but Champagne from designating their manufacture as "champagne."

It has become a custom in this country to call our sparkling wines "champagnes," but were our practice in courts of law as rigid as those of France there is no doubt but that the use of this term in connection with our sparkling wines could be prohibited.

Your friend was perfectly right in stating that neither in Germany, Italy, or in any other wine-producing country, nor in France, outside the province of Champagne, have people any right to call their product "champagne," nor do they do so, save as a means of deceiving the unwary purchaser.

We trust that this information will be satisfactory, and have the honor to remain,

Very truly yours,

CHARLES MCK. LÆSER'S SONS.

Mr. J. KOHNSTAMM,
Newark, N. J.

Mr. RIPEN. Those gentlemen are the proprietors and editors of Bonfort's Wine and Spirit Circular.

As to the point which our competitors brought out, that the manufacture of carbonated wine cost 75 per cent less than the other, it is my firm belief that the difference in cost, if any, is very small, even probably only 15 per cent.

The CHAIRMAN. This is true, is it not, that the fermenting of the wine in the bottle takes them at least four years? That is what they all stated, and I see no reason why they should misstate it; they all seemed to be reputable gentlemen.

Mr. RIPEN. It is my belief that there never was a champagne fermented in the bottle in this country which took four years. I do not believe that it took any longer than two years. People who have been working for those men, at the head of their cellars, have informed me that it took on an average a year and a half.

The CHAIRMAN. Of course that would be only hearsay evidence?

Mr. RIPEN. Yes.

The CHAIRMAN. It is only what other people tell you?

Mr. RIPEN. Yes.

The CHAIRMAN. You never have fermented any wine in the bottle yourself?

Mr. RIPEN. No.

The CHAIRMAN. And what you state about it in that respect is merely as a basis of your opinion, and is hearsay?

Mr. RIPEN. Yes. There has been something like deception, I think, on the labels, but we put our own name, "Ripen & Co.," on the bottles. I believe there are also some carbonated-wine makers who put fictitious labels on their bottles.

The CHAIRMAN. You do not think that that is good, honest business, though, do you?

Mr. RIPEN. No. I believe that if a man is not ashamed of the goods he puts up he should put his own name on them.

Senator FOSTER. What percentage of the champagne in this country is artificially carbonated?

Mr. RIPEN. Do you mean of American make or imported?

Senator FOSTER. All sold in this country.

Mr. RIPEN. There is a good deal of champagne sold here which is carbonated on the other side.

Senator FOSTER. Labeled as if fermented in the bottle?

Mr. RIPEN. Yes.

Senator FOSTER. What percentage of the champagne made in the United States is, you think, fermented in the bottle?

Mr. RIPEN. I should think about one-third is fermented in the bottle and two-thirds carbonated.

The CHAIRMAN. How is it with regard to the imported champagne that is used here?

Mr. RIPEN. As to the imported champagne, to the best of my belief the majority of that is the naturally fermented wine.

Senator FOSTER. But you know that some of it is carbonated?

Mr. RIPEN. Oh, yes; and it is openly known in the trade. They send it here.

Senator FOSTER. Marked "Mumm" or "Krug?"

Mr. RIPEN. Yes. I do not specify those wines, however, as being so treated.

Senator FOSTER. But some wines are falsely so labeled?

Mr. RIPEN. Yes.

The CHAIRMAN. And sold as the wine for which they are labeled?

Mr. RIPEN. Yes.

The CHAIRMAN. You do not yourself make the gas that you use?

Mr. RIPEN. No; and I would state that no doubt the answer to one of your questions put to one of the other wine makers was misleading. He said that the gas was made from sulphuric acid and marble dust. I do not believe that carbonic-acid gas is made at all to-day in this country from sulphuric acid or marble dust. In order to make plain to you the quality of gas which we use, and which comes from the natural springs and is clarified, we have brought with us Mr. Minor, the chemist of the Carbonic Acid Gas Company in New York.

The CHAIRMAN. We shall be glad to hear Mr. Minor.

TESTIMONY OF JOHN C. MINOR, JR.

JOHN C. MINOR, Jr., sworn and examined:

The CHAIRMAN. Please state your profession and residence.

Mr. MINOR. I am an analytical chemist and consulting chemist; address, No. 40 Hudson street, New York City. I am also secretary and manager of the New York Carbonic Acid Gas Company, and, as Mr. Ripen said, I am also chemist for that company.

The CHAIRMAN. Where did you study chemistry?

Mr. MINOR. I am a graduate of Yale University.

The CHAIRMAN. When were you graduated?

Mr. MINOR. In 1894.

The CHAIRMAN. And since that time you have been occupied in the pursuit of that profession?

Mr. MINOR. Since that time I have been engaged for two years in the superintendency of a manufacturing establishment in which food products were made, and for about three years I have been engaged in the manufacture, and of late in the importation also, of liquefied carbonic-acid gas. In addition to that I have had my own analytical laboratory and have carried on a general chemical business.

The CHAIRMAN. You are called specially to answer a few questions in regard to the use of this carbonic-acid gas that you use in what we call carbonated wine, or champagne artificially prepared. How do you make that gas?

Mr. MINOR. That gas is and can be made in various manners. The process by which the gas is prepared which is used for the purpose of carbonating champagne is not a process of manufacture, but of collection.

It is certainly as proper to consider the gas which we use as nature's own process of generating carbonic acid as to consider natural the process whereby nature generates carbonic acid in the fermentation of sugar. There is, to my positive knowledge, only one place in this country where gas is generated in this way (that is at Saratoga); that is to say, in such quantity as to make its collection and sale a commercial possibility.

The preparation of gas at that point in the State was decided upon by people who had learned what had been done in Germany at or near the district in which the Apollinaris and the other famous German

springs are situated. There they have water from these springs coming up out of the ground from a very great depth—a depth so great that there is no danger of their mixture with surface gases or decomposition of carbonaceous matter. By carbonaceous matter I mean organic material. Water coming from these great depths reaches the surface charged with a very considerable pressure, due to the presence of more carbonic acid gas in the water than the water would hold if subjected to merely atmospheric pressure; so that, when it is subjected to atmospheric pressure on reaching the surface, the excess of carbonic acid gas in it is led off through pipes into a gasometer, and, either previous to its entrance into the gasometer or subsequent to it, it is, in Germany, passed over a drying apparatus which absorbs all traces of moisture in it. That is the only impurity in the gas collected in Germany which it is necessary to remove from it, and it is not, properly speaking, an impurity. It is only abstracted because the subsequent use of the gas is facilitated if it is dry.

The very small aperture in the valve which is used to hold that gas under pressure would freeze up and would stop if you did not use a dry gas—not so much as to prevent its use, but it is better if the gas is dry. That gas is as nearly chemically pure as it can be made. In all my experience as a chemist I know of no article made on so large a scale where so high a degree of purity is reached as shown by the analyses of the gas. I have myself analyzed the gas and I know these facts from my own experience. It can be properly spoken of as a chemically pure article. Ninety-nine and one-half per cent pure in commercial articles is, I think, accepted by any chemist as a statement that the article is chemically pure. For analytical purposes, where we use only very small weighings, as in milligrams, we would look for two-tenths of 1 per cent more purity perhaps.

The introduction of this gas, which, as I have said, is a pure gas, into a still wine, means its absorption by the wine, and the supernatant gas is pure carbonic acid gas and nothing else.

I think that in that way there may be said to be a difference between the naturally fermented wine and the artificially carbonated wine.

The carbonic acid gas that is produced in the natural fermentation is not in any way different from that which is artificially forced into these still wines. It is produced, in the case of the natural wine, from the fermentation of the sugar into alcohol and carbon dioxide through the presence of yeast. Now, Pasteur was the first man who showed that if you carried the fermentation to a point where all the sugar was decomposed you did not get an amount of alcohol and carbonic acid gas that represented the amount of sugar originally present in that solution. There was a loss of about 5 per cent somewhere, and it has not yet been determined to a certainty what becomes of that other 5 per cent. There are secondary decomposition products formed. There are traces of glycerin, traces of succinic acid, and there are other products.

Now, the naturally fermented champagne is kept closed up during the process of fermentation, so that these secondary decomposition products do not get a chance to get out. Whatever they are, they are in there. In the case of the still wine they do not depend on carbonic acid gas. A still wine is a fermented wine, of course, but all wines are made from fermentation. The only material added to it to

make it a champagne is the carbonic acid gas, of which we know the physiological effect.

The physiological effect was stated to me by a physician yesterday (I do not know it of my own experience). The physiological effect of a champagne "drunk" is not commensurate with the amount of alcohol contained in it, and it is of a more decided and more unwholesome effect than the results produced by too much consumption of the artificially carbonated champagne. And the only difference that we know of that exists between the two is that we have this secondary decomposition going on in the naturally fermented champagne. In the artificially made champagne we do not hold back the products and refuse them a chance to escape when they are formed. There is a difference, but what difference exists at all exists in favor of the purity and wholesomeness of the artificially carbonated champagne, from a chemist's standpoint. You are there putting a pure carbonic acid gas into a still wine which of itself has been testified to be pure. In the other case you are getting products which are not known to be pure.

The CHAIRMAN. Do you furnish this imported carbonic-acid gas to the trade?

Mr. MINOR. We import this gas from Germany for ourselves. I am also familiar, of course, with the manufacture of our own gas. We do not sell that to wine people; that goes to bottlers of soda water, etc. With us everything must be as nearly perfect as possible, and that perfection we find in the imported gas—the German gas.

The CHAIRMAN. That, as you have testified, is taken from Nature's spring, and dried. How is it shipped?

Mr. MINOR. It is shipped in steel cylinders under a pressure of a thousand pounds to the square inch.

The CHAIRMAN. Is it pumped into those cylinders?

Mr. MINOR. Yes; by compressors, just as you liquefy air. In the process of carbonating champagne the gas is forced into the wine, of course; but the carbonic-acid gas in the natural champagne is not an inherent part of it. The carbonic-acid gas that is produced in the natural fermentation can be isolated until practically the last moment. If it were allowed to ferment in an open place all the carbonic-acid gas would disappear. As the process of collection now is, in the case of brewing, where they are obviating the disadvantage of the second fermentation, where they have to let the beer stand for a long time to evolve enough carbonic acid to make it satisfactory for bottling and for "aging," they find that they can allow the carbonic acid to be evolved in the first fermentation; they can provide for its collection and then run the beer straight from that fermentation to the bottling tables—passing through an apparatus that evolves the carbonic acid. So I am told by many brewers. Some brewers, finding that process too costly, use artificial gas and get the same results. It is pure carbonic acid.

I believe the statement was made here that the carbonic-acid formula contains sulphuric acid and marble dust. There are certainly not over two firms in the United States, out of twelve here in the East with whose processes I am familiar, who use sulphuric acid. If a trace of the acid were permitted to get into the carbonic-acid gas it would involve them in the greatest injury possible. You can see what a little acid in those steel cylinders would do, gradually weakening them until they would burst. Business men could not afford to have that occur.

The CHAIRMAN. If they use an acid made of marble dust and sulphuric acid they would not need that pressure?

Mr. MINOR. Not if they generated their own. Carl Schultz, the New York mineral-water manufacturer, generates his carbonic acid from adullomite, and pumps it up to 150 pounds pressure. It is a common opinion among the best physicians in the city that it is better to use an artificial water, when you know the composition of it, than to use a natural water, as to which you do not know what you are getting from time to time. But whatever it is made from, the carbonic acid put on the market to-day by all the firms, although, as I say, we have not in this country the apparatus for drying the gas that they have in Germany, we have not got it on so tremendously big a scale as yet, yet we have a gas purer than that which is evolved from the wine itself.

The CHAIRMAN. Mr. Ripen testified that you furnish him the gas which he puts into his wine. Do you?

Mr. MINOR. Yes.

The CHAIRMAN. And you testify that it is the natural carbonic acid gas which you import from Germany?

Mr. MINOR. Yes.

The CHAIRMAN. And that it is not a manufactured gas?

Mr. MINOR. Not a manufactured gas.

The CHAIRMAN. But a perfectly natural product.

Mr. MINOR. Yes.

TESTIMONY OF AUGUSTUS C. WERNER, JR.

AUGUSTUS C. WERNER, Jr., sworn and examined:

The CHAIRMAN. Please state your residence and occupation.

Mr. WERNER. My residence is in New York. I am a champagne manufacturer, my business being at 52 Warren street, New York.

The CHAIRMAN. Do you manufacture what is known as a carbonated champagne or do you ferment the wine in the bottles?

Mr. WERNER. We do not ferment the wine in the bottles. We inject the gas into the wine.

The CHAIRMAN. Where do you purchase your original stock—where do you get your wines?

Mr. WERNER. Our wine comes from Sonoma County, Cal.

The CHAIRMAN. What is the process of manufacture?

Mr. WERNER. We get a wine that is three or four years old—according to what the people want. We have it shipped here and it remains in our cellars from six months to a year. In that way we allow any sediment that may be in it to be precipitated. Then that sediment is taken off. After that we filter it, so that it is absolutely pure. Nothing remains in the wine except the pure wine. Then we carbonate it—that is, we infuse carbonic acid gas into it.

The CHAIRMAN. How is that done? There is no secret about it, I suppose.

Mr. WERNER. No. There is a certain apparatus by which it passes through the liquid. While the liquid is going through the cylinder it is mixed with the gas. There is no agitation.

The CHAIRMAN. The gases go one way and the wine the other?

Mr. WERNER. Yes.

Senator FOSTER. And they come together?

Mr. WERNER. Yes. It is not as was represented by some of the other wine men here. We get our carbonic acid from Oberlahnstein, in Germany. It is the same gas with which they carbonate the Apollinaris water. It is said that that is a natural water, but it is not. It is natural when it is in the ground. They take it out, separate the gases and purify the water. Then they put the gas back into the water.

The CHAIRMAN. The Treasury Department has held—the matter was argued by, I think, Roscoe Conkling; it may have got into court, but at any rate the Department held that where water was taken from a spring and charged with the gas that came from the same spring it was a natural water and not an artificial water.

Senator FOSTER. How do you label your wines?

Mr. WERNER. We label them "A. Werner & Co." I have a specimen of the label here, if you wish to see it.

The CHAIRMAN. Yes; we should like to see it. Show it to Senator Foster.

Mr. WERNER (exhibiting the label). Everything is American with us. We use no foreign name.

Senator FOSTER. This label reads "Extra Dry. A. Werner & Co. Vintage of 1897. Sonoma."

The CHAIRMAN. The word "champagne" is not used on that label?

Senator FOSTER. No.

The CHAIRMAN. What do you mean by the term applied to wine "extra dry?"

Mr. WERNER. Some wine is not as dry as another.

The CHAIRMAN. But what do you mean by "dry"—all wine is wet to me? [Laughter.]

Mr. RIPEN. Absence of sweetness is what makes it dry. A vinegar would be "sour" in the absence of sweetness; a wine is "dry." All these wines would, in the natural state, be brut; but they are sweetened up a little, to suit the palate.

Senator FOSTER. As to those champagnes that are made from California wines, are any of them labeled as foreign wines that you know of?

Mr. RIPEN. Many makers—a majority of those who were here—have labels containing French words, which must be to give the impression that they are foreign. I do not say that all of them do, but some do, use foreign labels; using French words on the labels; such words as "Cuvée" and words like that. We openly put our names on our labels. To give you some idea of the business, I will say that perhaps a thousand street cars contain our advertisement, offering wine for 50 cents a pint, or \$1 a quart, and I presume we have done pretty nearly as much business with two small concerns as all those five other establishments put together.

Senator FOSTER. By pushing your trade?

Mr. RIPEN. Yes; and by taking small profits. I have gone around myself to the doctors in New York City, and have said, "Here is a wine we are making that you can recommend to your patients if they are sick; a wine that they can get for 50 cents a pint." We say "Let

any chemist examine this wine, and if it is not what we say it is, we will pay the expense of the examination. It is less injurious than the natural wine, by reason of not having the by-products.

The CHAIRMAN. The question before this committee, and what the wine makers are urging, is that it should be marked. We are going on the theory from the beginning that everything should be marked for what it is; and if we should say to you that you should mark your product "Artificially carbonized," we would say to the other makers that they must mark their products "Fermented in the bottle."

Mr. RIPEN. Yes; but our answer to that is that in the original sense they do not make champagne; we do not make champagne. Even the stuff that comes over here from abroad is not champagne any more.

The CHAIRMAN. If there is any well-defined difference a person ought to know what he is buying, ought he not? The matter of educating the people to know that, as you say, the artificially carbonated wine is just as good (or, as you put it, perhaps better) as it seems—ought not that matter to be left to the manufacturer; but let the consumer know whether he is buying carbonated wine or wine fermented in the bottle, just as people who ask for honey ought to know whether they are getting honey or glucose?

From what the other wine men said, I imagine that they do not want to put on their bottles the words "Fermented in the bottle," but it would seem that if Congress were going to require one class of makers to mark on their packages or bottles the nature of the contents, they should require another class to do likewise. That has been the policy heretofore. That is the way we got our flour bill through. We had evidence before the committee that pure corn flour was better than the wheat flour, and the parties sent me some of the bread made from it. They claimed that it was better than the bread made from ground wheat.

Mr. RIPEN. I do not think, Mr. Chairman, that the two cases are analogous. We do not introduce any other substance into our wine. We take for granted that both wines are straight. Our wine is absolutely pure and clean. And if you go into the trade and ask a liquor dealer anywhere what champagne is, he will tell you it is an effervescent wine." The dictionaries and encyclopedias published of late years all give that definition. In three years we have built up a better business and sold more goods than the other people who have been in the business twenty-five years.

Senator FOSTER. Do not people generally think that wines made that way are more deleterious than those fermented in the bottle?

Mr. RIPEN. We fear that if we should put on our bottles "Carbonated wine," or anything of that sort, people would think it was some medicated stuff.

Senator FOSTER. If the other wine makers were to put on their bottles "Fermented in the bottle" what would be the effect of that?

Mr. RIPEN. It would probably affect both American champagnes and run the trade more to the foreign champagnes. There are a number of cheap foreign wines on the market.

Senator FOSTER. How is bottled cider prepared?

Mr. RIPEN. That is not a juice of the grape.

Senator Foster. No; but is there not some preparation used in bottling it?

Mr. RIPEN. In the carbonation of wine you have to have an absolutely pure article, because if you do not you will afterwards have what is called a precipitation. The foreign ingredients will form a combination, producing a precipitate, and the wine becomes dark and thick. It is a bad thing for the wine and would kill it immediately. So that in order to have a carbonated wine that will stand, you have to have pure wine.

The CHAIRMAN. What is the import duty on champagne?

Mr. RIPEN. About \$8 a case.

The CHAIRMAN. About 66 cents a quart.

Mr. RIPEN. Yes. And one concern imported last year 103,000 cases; another imported 40,000 cases. The importers combined with those other people last year in an attempt to prevent us from using the word "champagne."

It is easier for a man to pay 50 cents for a pint than to pay \$1.75. I compared the other wines with ours, just as a man would compare cocktails of different whiskies. A man who drinks the natural champagne at night will arise in the morning with a "big head" on him; if he drinks our champagne he will get up in the morning all right; I do a good deal of the selling of my wine and in order to get it introduced I make the tests; I prove that my wine will effervesce as long as the other and even longer than any natural wine made in this country. I will say that my wine will effervesce about as long as the imported—the better grades; and it will effervesce longer than any American fermented wine.

Mr. WERNER. They say that we should put on our labels the words "Imitation champagne."

The CHAIRMAN. No.

Mr. WERNER. Or "Artificially carbonated wine."

The CHAIRMAN. Yes.

Mr. WERNER. In that case people would think that it was an artificial wine. You do not have to say that it is artificially carbonated. "Carbonated wine" would be sufficient. If you call it "artificial" people would think it was an artificial article.

The CHAIRMAN. Yes, that would be prejudicial.

Senator FOSTER. Yes, I should think that would be prejudicial.

TESTIMONY OF FRANCIS B. THURBER.

FRANCIS B. THURBER, sworn and examined:

The CHAIRMAN. Please state your residence and occupation.

Mr. THURBER. I am president of the American Grocer Publishing Company, 143 Chamber street, New York.

If the committee will permit me, I think it would be best for me to make a short preliminary statement, showing my experience, etc., so as to qualify my testimony to be considered that of an expert. Perhaps that might be best.

The CHAIRMAN. Yes. I know you have taken a great deal of interest in the manufacture of pure food, and I shall be glad if you will state, for the purpose of the record, when it was that you first took an interest in the subject and what steps you have taken in regard to it.

Mr. THURBER. For thirty-five years I was in the wholesale grocery

business and engaged in the manufacture and sale of food products on a large scale, and was very much interested in the question of pure food.

Many years ago I became convinced that we ought to have regulative legislation that would protect the public health and at the same time not be unduly onerous upon trade. Some twelve years ago I proposed to the National Board of Trade, which is the most representative collection of commercial organizations in the United States, that there ought to be a thorough consideration of this subject of regulative legislation by a committee that would embody the doctor, the chemist, the judge of health problems, the jurist, to judge of what was constitutional and proper, and the business man to judge of the effect upon trade.

I then placed a thousand dollars at the disposal of the National Board of Trade, to be awarded in prizes by such a committee, for the best draft of an "adulteration act."

The president of the National Board of Trade appointed a committee consisting of Prof. Chas. F. Chandler, the chemist, of New York, as chairman; Chancellor Williamson, of New Jersey, as the jurist; Mr. John A. Gano, of Cincinnati, and myself, as business men, and I forgot who was the physician.

The committee offered a first prize of \$500, a second prize of \$300, and a third prize of \$200 for the best draft of an adulteration act which would best protect the public health and not unduly embarrass business. They occupied a year in that investigation, received a large number of drafts of acts, and awarded the prizes. Taking the first-prize act as the basis, we formulated an adulteration act which has become the basis of State regulation of food in the principal States—New York, Ohio, Illinois, New Jersey, Massachusetts, and others. Most of the States have made variations in their provisions, but so far as definitions are concerned they are largely those which were outlined by this committee of which I have spoken.

It has become more and more evident of late years that with the growth of interstate commerce there should be national legislation on the subject of food adulterations. As you know, there have been a number of bills introduced for several years looking to that end. The subject has steadily grown, and there have been several pure-food conventions held, in which Dr. Wiley has been an important figure. He has done more than any other man I know of to advance this legislation and to get reasonable and proper and just legislation on this question.

Having made that preliminary statement, in order to show my experience and my interest in the subject, I shall be glad, Mr. Chairman, to answer any questions which you may propound to me.

THE CHAIRMAN. I wish you would state, if you please, Mr. Thurber, something with reference to the sophistication of foods; whether there is much of that, and what are its effects.

MR. THURBER. The adulteration of food divides itself naturally into two distinct channels. One is a crime against health, and the other a crime against the pocket.

There are many deleterious substances used in the adulteration of food, and of those, I think, the use should be absolutely prohibited. Then there are many substances used for the purpose of increasing the bulk or weight or lowering the quality—the cheapening of the

quality. Those are, many of them, entirely innocuous, but they are made by the manufacturers in order to get a greater profit, and they unquestionably, in many cases, deceive the consumer.

The question of labeling and selling an article for what it is worth is good up to a certain point and applies to a considerable line of articles, and is a sufficient protection to the public so far as deception is concerned and making the public pay more than the goods are really worth. But there is a very important branch of adulteration as to which such a designation is not sufficient. In my opinion, the public authority should step in to decide what is and what is not deleterious, of those substances used in the manufacture of various products, and that the use of those substances should be prohibited, because the average consumer is not competent to decide the question whether an article is or is not a fit article for him to use.

The labeling of articles is in a great degree ineffective, because of the manner in which it is done. The statement of a formula on a label is not effective in preventing the use of deleterious articles, because, as I said, the consumer does not know in a great many instances whether it is deleterious or not.

Again, scientific terms with which the public are not familiar, and which are of a technical character, are used upon labels and do not convey any well-defined meaning to the average consumer.

I believe that there should be an authority lodged somewhere to decide what is and what is not deleterious. For instance, take this question of baking powders which was under discussion here when I came in this morning. There has been more or less dispute as to whether alum was or was not deleterious in baking powders. My firm was a considerable manufacturer of baking powders, and we investigated that subject as carefully as we could. We took the best authorities that we could find. And while there was a great inducement to us to use alum, as a cheaper product, if it was not deleterious to health, we made up our minds that it was deleterious to health and that it was one of those substances, as stated by the doctor who was testifying here upon my entrance (Dr. Mallet), that while the use of a single loaf of bread might not perhaps be noticeable as involving deleterious effects, the cumulative effects of mineral substances like alumina, would in time be very deleterious.

Now, the poorer class of people are the most imposed upon, because their means are slender; they buy things that are the cheapest, which are represented to them as fit for food, and as a rule they are not as well able to distinguish between what is and what is not proper food, and in some parts of the country, as in the South, for instance, in the case of the colored population, a large number of them are not able to read, or at any rate are not able to judge of the propriety of certain articles that may be mentioned on the label, and hence I think that competent authority must decide what is and what is not a deleterious substance, and the use of those which are considered deleterious should be prohibited.

Take the case of that numerous class of preservatives used to prevent fermentation in food—articles of which salicylic acid is a type. I believe the concensus of opinion of medical men is that it is deleterious. There are a number of those antiseptics which I believe are deleterious, and where the quantity used is of course a consideration—a very small quantity may not be deleterious while a larger quantity would

be so—at the same time, somewhere there has got to be lodged the authority to decide what is and what is not deleterious, and that which is deleterious should be prohibited to be used. That which is wholesome, but which is a fraud on the pocket of the consumer may then be left to proper labeling, so as to prevent deception.

But there is a very important distinction in my mind. I do not know whether Dr. Wiley would concur with me in that or not—that a thing which is deleterious ought not to be used—its use ought to be prohibited because it is difficult to decide as to just what quantity should be used.

Senator FOSTER. Then you would prohibit the use of it entirely?

Mr. THURBER. I should prohibit the use of it entirely.

The CHAIRMAN. I suppose that would mean as between the States, which is what we can do in Congress. Now taking your experience, what items do you deem most important?

Mr. THURBER. I think one of the most important is that class of articles in which antiseptics are used, and I think baking powders another. I think those two branches are perhaps the most important to public health of any that have come under my notice. But, Mr. Chairman, I would like to get the idea thoroughly into your mind and ask your most careful consideration of what I have emphasized, namely, that there must be somewhere an authority lodged to decide whether a thing is deleterious or not.

Mr. CHAIRMAN. Yes; I appreciate that.

Mr. THURBER. And if it is deleterious, it ought to be prohibited entirely.

The CHAIRMAN. You think that antiseptics and the use of alum in baking powders are two items, for instance, that are deleterious?

Mr. THURBER. Yes, those are things that have come under my observation. There may be others.

The CHAIRMAN. Of course.

Mr. THURBER. But so far as these matters have come under my observation, as they did for many years, it seems to me that those two are about the most important that we have to deal with for the health of the community.

The CHAIRMAN. I have introduced in the Senate a bill on this subject of food adulteration. It has been referred to this committee, and I hope to have a printed copy of it handed to you to-day. It has the approval of Dr. Wiley, who, I agree with you, has done very much for the health of the people in these matters. I would like you to make such comments on that bill as suggest themselves to you. You have no interest in manufacturing matters now?

Mr. THURBER. No, I am entirely out of that business now and am engaged in the publication business.

Dr. WILEY. In your bill, Mr. Chairman, Mr. Thurber will find that you have provided for the very subjects on which he has made such emphasis.

Mr. THURBER. I am very glad to hear that.

There is one other point which I mentioned to Dr. Wiley the other day, and that is the matter of publicity. The competition among manufacturers is very keen, and if provision be made for the analysis, and for the publication of such analyses as are made, of the articles which Dr. Wiley told me would be provided for in the bill, there you have the rivalries of trade coming to bear upon the manufacturers. That,

in itself, is a very great protection to the public health. In some previous attempts at protection there has been a good deal of opposition among the manufacturers to such a position, but I think that is a very important one to insist upon. I would stand for that to the last.

The CHAIRMAN. I appreciate the importance of that. Why, the mere taking of the evidence by this committee in the great cities of the country has had a very great effect.

Senator FOSTER. It has had a good effect?

The CHAIRMAN. Decidedly so.

Mr. THURBER. Here is another point that, according to my experience, is important. The great majority of manufacturers prefer to use wholesome materials, and yet sometimes through unprincipled competition of persons who are using inferior materials they are "sandbagged" into lowering their standard of products, and the manufacturer who endeavors to maintain a high standard is entitled to the protection of legislators, so far as it is possible to give them protection.

The CHAIRMAN. Merchants came before us in Chicago and showed us a coffee which had 20 per cent of what is called "black jack" mixed with it, and told us they were obliged to compete with such coffee. A copy of this bill will be here shortly and I will send you one.

Mr. THURBER. I suppose if I should write to you about it from New York it would be all that you desire?

The CHAIRMAN. Yes.

The subcommittee adjourned to Saturday, January 20, 1900, at 10 o'clock a. m.

TESTIMONY OF DR. HARVEY W. WILEY—resumed.

Dr. HARVEY W. WILEY, recalled and further examined:

The CHAIRMAN. I have recalled you, Dr. Wiley, for the purpose of finishing your examination. I will ask you to give the committee at this time the benefit of the analyses you have undertaken to make, so far as they are completed.

Dr. WILEY. When I came before the committee the other day I had my samples with me, but I have concluded that it would take so much of the time of the committee to show them and explain them in detail that I have concluded it will be best for me to give a summary of the work.

Under your instructions I went with Maj. Duncan B. Harrison and visited a great many places in New York, such as groceries, drug stores, and saloons, and bought samples from them. We went purposely to the poorer quarters; not among the very poorest, not among the slums, nor yet among the very best places.

Senator FOSTER. You went to places to which the average workman would go?

Dr. WILEY. Yes; and where men of moderate means would go. At those places we bought a number of articles of food material, beginning, say, with beers and wines in the respectable quarters of the city. Then we bought a number of jellies, preserves, soups, catsups, and things of that description, and quite a number of samples of cream of tartar, because, as you know, many people in this country make their own baking powder at home. They go to the drug store and buy the bicarbonate of soda and cream of tartar and mix them at home. Even many people in moderately good circumstances make a habit of doing

that. All those goods I brought to Washington and had analyses made of them to determine their purity, composition, etc.

The CHAIRMAN. Did you buy sugars?

Dr. WILEY. We bought maple sirups, but not sugars. We had quite a large number of maple and other sirups supposed to be pure products.

To begin with the beers, of fifteen different beers, at least one-half of them of foreign origin, we found four—that is, 26.7 per cent—to contain salicylic acid; and of the foreign bottled beers two samples contained salicylic acid in quantities sufficient to preserve from fermentation. No other impurities were sought for in the beers except the preservatives, as that was all we were seeking for. These were all bottled beers, not drawn from the wood, showing that when bottled beers are prepared for consumption, if the time of sale is uncertain—that is, if they may be sold next day or may lie on the shelves for half a year or more—then, in order to preserve them, salicylic acid is used. When foreign beers are sent here in the wood and then bottled, it is probable that the preservative is added at the time of bottling.

Senator FOSTER. Embalming them, so to speak.

Dr. WILEY. Yes.

Of the domestic beers bottled and sold within two or three weeks we found only two of them to contain salicylic acid; the rest were all free from it.

As to the cream of tartars which I purchased, seven in all—and I purchased them mostly in groceries, getting only two or three in drug stores, because people go mostly to their grocers for them and the grocers keep them—out of seven samples which were sold to me as cream of tartar only three were cream of tartar; one other had about 24 per cent of cream of tartar in it, and one was nearly pure, having 93 per cent. The others had not a trace of it; the others were phosphate of calcium and calcium sulphate combined.

Senator FOSTER. Is it possible that they had no cream of tartar at all?

Dr. WILEY. Yes. It is a substance sold in the market as "C. T. S." (cream of tartar substitute). They were not labeled as a substitute.

The CHAIRMAN. They were sold as cream of tartar?

Dr. WILEY. Yes.

Senator FOSTER. And you bought them as cream of tartar?

Dr. WILEY. Yes; and I paid 50 cents a pound for them, the price of cream of tartar. They were sold as cream of tartar, although they contained no cream of tartar whatever.

The jellies, six in number, without exception were artificial, but sold as pure fruit jellies, and labeled as such, and containing a coloring matter in the shape of an aniline dye. They are made of glucose and flavored with extract from the cores of and peelings of the factories where apples are desiccated. The cores and peelings are made into a low-grade jelly, mixed with glucose and colored with aniline dyes and flavored with artificial essences.

To such an extent has this adulteration grown that you are not at all certain, even when you go into a high-grade store and ask for a jelly, that you are getting the pure fruit jelly for which you ask; and if you go into a lower-grade place, you are quite certain to get some composite article.

Senator FOSTER. Something you do not want.

Dr. WILEY. And something you do not ask for nor pay for. You pay a good price; you pay the price of the best article.

Senator FOSTER. What is the difference in price between glucose and cane sirup?

Dr. WILEY. Glucose within the past two years has sold by the earload as low as nine-tenths of a cent a pound.

The CHAIRMAN. Nine-tenths of a cent a pound?

Senator FOSTER. Less than 1 cent?

Dr. WILEY. Yes; and it is a little more than that now. I should say the price is about as 1 to 5 compared with the pure article. Pure maple sirups are worth more than that—they sell from about 7 to 12 cents a pound.

The CHAIRMAN. That would make about a thousand per cent difference?

Dr. WILEY. Almost. As I testified before the committee on a former occasion, I do not consider glucose an unwholesome article of food.

Senator FOSTER. That is what Professor Mallet said. The difference of price is, in that case, the element of fraud?

Dr. WILEY. Yes. The difference is in the pocketbook, as Mr. Thurber said. The people suppose that they are getting what they ask for, but they are not.

With regard to flavoring extracts, such as lemon extract and things used for flavoring food and for flavoring soda water, many of those on the market, I think, are artificial compositions. It is quite an unusual thing now to get a pure fruit flavor in soda water.

The CHAIRMAN. I remember that when we first went to Chicago Dr. Price came and invited the committee to go into his laboratory and see everything that he used. My recollection is that you examined them. Did you?

Dr. WILEY. Yes, I did; and we always found them pure.

The CHAIRMAN. He was perfectly willing to show us everything. Other factories would want people to take samples.

Dr. WILEY. I do not want the committee to think that there are no pure food articles on the market. The newspapers reported me in Chicago as saying that 95 per cent of all the foods in the United States are adulterated. Of course, I never made any such statement to the committee, as the official records showed that I did not; but I said that probably 95 per cent of food products had at some time or other in some country or other been adulterated. I did not wish to convey the impression that most of our foods are a fraud, because they are not.

Senator FOSTER. That cream of tartar transaction showed that there is some fraud.

Dr. WILEY. Yes; it is well-known that there are some. Cream of tartar is expensive. I paid 50 cents a pound for what I bought.

The CHAIRMAN. There is a well-defined distinction between the cream of tartar baking powder and the alum baking powder and substitutes.

Dr. WILEY. There is a very great difference in the cost of making.

The CHAIRMAN. Did you buy any cream of tartar such as is made by the cream of tartar companies?

Dr. WILEY. I went to a factory in Jersey City where they make cream of tartar and took the samples myself out of the bins in process of manufacture. I had the permission of the manufacturer to go in and do that as they were at work. I took samples, beginning with

the crude argols as they came into the factory from the wine factories, and then took samples at each step of the progress of the work throughout the whole range of processes up to the finished article. I found that the cream of tartar I got there was chemically pure; so pure that I am using it to-day in standardizing for analytical work.

Senator FOSTER. Men that are making the pure article are willing to let you see their processes?

Dr. WILEY. Yes; they have nothing to conceal.

Senator FOSTER. The others are not willing to let you do that?

Dr. WILEY. No.

Without going into details, but summing up the results of the work of analysis on the samples purchased under the auspices of the committee, I will say that the analyses simply corroborate the evidence I gave before your committee in regard to such matters as I have been describing and with which I have been dealing in a similar way for the past fifteen years. I will repeat that the adulteration of certain kinds of food products is very extensive. Immense quantities of honey, for instance, that are sold in this country are entirely innocent of the beehive. Other packages of honey are sold in which a little piece of genuine honeycomb is put into the bottle and the bottle is filled up with glucose. In that case, of course, people think it is the pure article because there is the comb plainly in sight. The mass of the material is glucose.

Eleven samples of honey were purchased in connection with this work and examined in the usual way. Of these, three were pure, two of doubtful purity, and the others, six in number, adulterated with cane sugar or commercial glucose or both.

This goes to show that the former observations which we have made of the immense extent of the adulteration of honey are still borne out by the present conditions. It is probably safe to say that 50 per cent of the strained honeys on the market in the United States are adulterated.

In regard to wines, six samples were purchased, five of foreign origin and one of domestic origin (at least, judging from the labels, which were all that we had to guide us in the matter). Of the five foreign samples, three contained salicylic acid and two were free of any preservative. The domestic sample contained no preservative.

It was shown that the wines purporting to be of foreign origin contained salicylic acid, and in this case more than 50 per cent of the whole number were thus adulterated.

An exceedingly interesting observation was made also on three samples of wine purporting to have been made at Paducah, Ky., or at least distributed from that place. They were marked "Sherry," "Port," and "Sweet Catawba." These wines were absolutely artificial and contained no fermented grape juice at all. They were made of alcohol and commercial glucose, a little tannin, and artificial coloring matter, consisting of aniline dyes. The coloring matter was in such large quantities that several tufts of wool were beautifully dyed with the colors abstracted from the samples. These wines imitated in a general way the flavor, aroma, and taste of the genuine articles, and could be sold to persons not acquainted with the property of wines without their fraudulent nature being discovered. The fact that Paducah is not known as a wine-producing region led to the suspicion that these wines were purely artificial, and this suspicion was verified by the results of the examination.

Spices and condiments are very largely adulterated, and, as I have

shown by the evidence to-day, the cream of tartars sold by the grocers for home consumption are largely counterfeit articles, some containing no cream of tartar at all and some a little. Occasionally you will get a genuine sample.

Senator FOSTER. How is a man to know?

Dr. WILEY. It is absolutely impossible.

Senator FOSTER. He pays the price of cream of tartar?

Dr. WILEY. He pays the price, but he has no protection. The city or the State can police its own people and protect a man in that way, and many of the States are doing that, but that does not get at the root of the evil. The root of the evil will not be got at until the General Government places its hand on the business.

I would like to say for the benefit of the committee that since this investigation by this committee has begun the public are beginning to see the matter in a different light. Up to that time it was supposed that interested parties were trying to get some job through Congress; but now the people realize that this is a great movement, which has its inception in the Senate and is intended for the public welfare.

In order to ascertain the feeling throughout the country on the subject of the work on which this committee is engaged, I subscribed to a bureau of press clippings and have received hundreds of clippings in regard to food adulteration. Out of the hundreds of clippings that I have thus received there is not a single one that has not commended the action of the committee. The clippings relate to the work of the committee. They show that there is not a single paper in the United States that is opposed to the work which the committee is doing. Every one of them has spoken of that work and of the great necessity for it. So that there is a universal public sentiment in favor of it. The only opposition will be from people who are making or selling counterfeit articles. I can safely say that 90 per cent of the manufacturers of this country are in favor of this bill which the chairman of this committee has introduced in the Senate, a copy of which I will append to my testimony.

The CHAIRMAN. I intend to offer an amendment to the bill which shall provide that all manufactured food products that are preserved, canned, or put out for sale shall have the name of the manufacturer on the package, so that in case of any accident occurring or any sickness caused by any food product, any investigation which may be undertaken by the Department having charge of the execution of the provisions of this bill, if it shall become a law, can be intelligently conducted, and so that goods will not be marked with the name of Smith when in fact they are manufactured by Jones. Would you approve such an amendment to the bill?

Dr. WILEY. I would if necessary; but in fact that is provided for in the bill.

Senator FOSTER. The name and address of the manufacturer are to be placed on the package?

Dr. WILEY. The bill provides that all manufactured articles of food shall be labeled or tagged in such a way as the Secretary of Agriculture may direct.

Senator FOSTER. That will cover it?

Dr. WILEY. That covers the whole ground.

The CHAIRMAN. We can put in an amendment providing that the name of the manufacturer shall appear.

Dr. WILEY. Yes; the committee can insert a provision that the name of the manufacturer shall be on the package. That would be a protection in thousands of cases, because a manufacturer would be careful if his name had to be placed on the goods.

The CHAIRMAN. During the examination of Dr. Austen, of New York, at one of the late sittings of this committee, and, I think, before you came into the room, Dr. Wiley, Dr. Austen was describing certain experiments by Professor Mallet on baking-powder residuum. Speaking of those experiments by Professor Mallet, Dr. Austen said: "He then made quite a large quantity of it and noted the effect produced upon himself. His impression was that it produced an oppressive sense. He thought it gave him indigestion. I am very frank to say that I do not think the experiments are of much weight. Professor Wiley, chemist of the Department of Agriculture, also considers that his physiological work does not justify his conclusions." What statement have you to make in regard to that, Dr. Wiley?

Dr. WILEY. I was very much surprised when I saw that statement, because I was not conscious of ever having uttered such sentiment anywhere, and I immediately wrote to Dr. Austen in regard to the matter. He was out of the city, and I did not hear from him until day before yesterday. Then he wrote me, "I only quote your opinion on page so-and-so of a certain bulletin issued from the Department of Agriculture." As I never remembered having expressed such an opinion, I immediately turned to the place indicated and looked it up. I found it to be the opinion of another man altogether. It was not my language at all, although it was published by the Department of Agriculture. Dr. Austen evidently thought (finding it in the bulletin) that it was my language. I was giving all the evidence I could get and discussing the matter on all sides. It is the statement of Dr. C. A. Crampton, and not my statement at all; and Dr. Austen has written me that he will make the matter right in the galley proof. I wrote him also to say that in quoting part of a statement he should quote it all and that in justice to Dr. Crampton his whole statement should appear.

Senator FOSTER. It might have a different effect?

Dr. WILEY. Yes. The statement is to this effect, that of all the baking powders Dr. Crampton considers the Royal to be the best.

The CHAIRMAN. That is the cream of tartar powder, is it?

Dr. WILEY. Yes.

The CHAIRMAN. What is your opinion about alum as food?

Dr. WILEY. My opinion is that it is a poor stuff for food. As I have said repeatedly, I do not use it in my own house and would not use alum in bread if I knew it. Alum is injurious.

The CHAIRMAN. Taking the weight of authority of scientific, unprejudiced, and disinterested men, the weight of authority of such scientific men is against the use of alum, is it not?

Dr. WILEY. Yes; because alum is regarded as injurious to the system by most authorities.

The CHAIRMAN. The manufacturers generally favor a national law. I will state that the manufacturers of beer, of whisky, and other products such as "extracts," and I think also of baking powder, and, in fact, of every leading article of manufacture, favor such a law. They desire that this proposed commission should be authorized to prevent or make punishable by fine or imprisonment the

use of another man's label, or the use of a facsimile for the purpose of deceiving.

Dr. WILEY. That is absolutely prohibited in this proposed bill.

Senator FOSTER. Everything that is misleading is prohibited?

Dr. WILEY. Yes. For instance, New York has a great reputation for cheese, but a great deal of cheese is made in other States and labeled as New York cheese.

The CHAIRMAN. For instance, "Herkimer County cheese."

Dr. WILEY. Yes.

The CHAIRMAN. That is absolutely prohibited.

Senator FOSTER. You are in the Agricultural Department, Dr. Wiley?

Dr. WILEY. Yes.

The CHAIRMAN. Dr. Wiley had been in the Department of Agriculture as Chief Chemist. The Secretary of Agriculture has been very kind in allowing him to take up this work on which we are engaged, as if it were in his own Department.

Dr. WILEY. I think the committee ought to know—perhaps its members do know—that the Secretary of Agriculture is interested, heart and soul, in this movement for the protection of the people in regard to foods; and he has approved of this bill which you, Mr. Chairman, have introduced in the Senate, as covering the ground as well as it can be covered.

The CHAIRMAN. Will you please state, Professor Wiley, if you have made a comparative examination of American and European champagnes and of carbonated wines which resemble champagnes?

Professor WILEY. Yes. I have made comparative analysis of the wines, with the results which follow. I made an examination of the samples of champagne furnished me by Maj. Duncan B. Harrison. They were entered in our books as follows: 19325, Golden Seal; 19326, Great Western; 19327, Cook's Imperial; 19328, White Top; 19329, Le Grande Monarque; 19330, A. Werner & Co., Extra Dry; 19331, Pommery Sec.; 19332, Moet and Chandon; 19333, G. H. Mumm, Extra Dry.

Examination.—The wines were placed in cylinders an inch in diameter to the depth of 5 inches in each and kept at a temperature of 16° and .5° C., equivalent to 62° F., from 12.30 to 5.30 o'clock. They were examined every half hour to determine the rate of effervescence. The samples showed very little difference in this respect. The bubbles, however, which came from the 19330, that is the Werner wine, were larger in size and less evenly distributed than from the other samples. In other words, the distribution of the gas in 19330 seemed to be less perfect than in the other samples.

The samples were allowed to stand overnight, and on the morning of February 6, at 9 o'clock, when they were next examined, it was found that all the effervescence had ceased. Even on jarring the cylinders no appreciable effervescence was produced in any one. The cylinders were then placed in a room at a temperature of 31° C., equal to 88° F. The rise of temperature, however, failed to produce any additional effervescence. This experiment shows that there was very little difference in the samples in regard to their ability to retain gas.

Color.—All samples were examined for color, the deepest color being marked 10, and a cylinder of water, used for comparison, marked

1. The depth of color of each sample marked on this scale is shown by the following figures:

19325, 7; 19326, 7.5; 19327, 7.5; 19328, 7; 19329, 10; 19330, 4; 19331, 7; 19332, 5.5; 19333, 6.

Odor.—On the morning of February 6 the odor of each of the cylinders was carefully tested. All of the samples, with the exception of 19330, which had a bad odor, were pleasant to the smell. The American wines, however, had a richer and nuttier flavor than those of foreign origin.

Chemical examination.—The samples were submitted to a chemical examination and the data obtained are found in the inclosed table. It will be seen from the data that the artificial champagne, viz, 19330, contained a much less quantity of alcohol than the natural champagnes. As shown by the polarization, also, this wine differs entirely from all the others in being right-handed to polarized life. The figures show that a considerable quantity of cane sugar has been added to this wine. The other data show that the natural American champagnes correspond very nearly to the standard European varieties in chemical composition.

In closing, I would say that these analyses show that an artificial champagne can be easily detected by chemical means, as well as by the taste and odor. In my opinion, all champagnes should be sold under their proper name and no artificially carbonated wine should be allowed on the market as a genuine champagne.

Serial number.	Extract (grams per 100 c.c.).	Ash (grams per 100 c.c.).	Extract-ash ratio.	Alcohol by volume.	Alcohol (grams per 100 c.c.).	Specific gravity.	Total acids, as tartaric (grams per 100 c.c.).	Volatile acids-acet (grams per 100 c.c.).	Polariscope, reading direct.	Polariscope, reading invert.	Reducing sugar (grams per 100 c.c.).
19325.....	5.8704	0.1036	40.1	12.09	9.59	1.0064	0.953	0.0786	-0.7	.....	2.71
19326.....	7.9348	.1184	40.9	13.10	10.39	1.0138	.953	.....	-2.6	.....	4.09
19327.....	7.0856	.1376	34.3	11.64	9.24	1.0150	.878	.0806	-2.0	.....	3.36
19328.....	6.7720	.1080	43.7	12.17	9.62	1.0101	.886	.0790	-2.4	.....	3.49
19329.....	8.0668	.1448	36.5	11.67	9.26	1.0157	1.050	.0798	-2.2	.....	3.77
19330.....	7.8028	.2040	30.8	9.84	7.81	1.0168	.748	.....	+23.3	+23.3	2.52
19331.....	4.2816	.1204	31.4	13.62	10.81	1.0001	.731	.0629	+.7	.....	1.50
19332.....	5.3280	.1100	34.5	12.63	10.01	1.0045	.785	.0764	+.4	.....	2.52
19333.....	4.9796	.1336	33.3	13.59	10.78	1.0042	.953	.....	+1.5	.....	1.52

The extract ash ratio is obtained by dividing the extract (minus reducing sugars in excess of 0.1 gr. per 100 cc.) by ash.

The polariscope reading was made on Schmidt and Harnsch instrument with 200 mm. tube, and is calculated to natural dilution of the wine.

WASHINGTON, D. C., January 18, 1900.

Senator WILLIAM E. MASON,

Chairman Senatorial Committee on Pure Foods.

DEAR SIR: Pursuant to your instructions, I herewith submit the following report:

I procured in open market a pint bottle of each of the following wines, viz:

Imported champagnes.—G. H. Mumm's Extra Dry, 1; Pommery & Greno, 1; Piper Heidsieck, 1; Moët & Chandon, 1; Veuve Clicquot, 1; total, 5.

American champagnes.—Cook's Imperial, 1; Great Western, 1; White Top, 1; Golden Seal, 1; Le Grand Monarque, 1; total, 5.

American carbonated wines.—A. Werner & Co., Extra Dry, 1; Ripin & Co., Extra Dry, 1; Frash & Co.'s Imperial Cabinet, 1; Germania Wine Cellars, Imperial Sec, 1; total, 4. Grand total, 14.

I placed the fourteen bottles, also a thermometer, in a refrigerator. After a period of two and a half hours had elapsed I opened said refrigerator and examined the thermometer, which registered 35 degrees. I withdrew the bottles of wine, uncorked them, and placed said bottles with the thermometer on top of a steam radiator, and then proceeded to time the escaping gases with the following results:

Actual time consumed for the total cessation of effervescence in each of the following bottles of wine.

AMERICAN CARBONATED WINES.

	Minutes.
Grand Imperial Sec.....	5
Werner & Co.'s Extra Dry.....	7
Ripin & Co.'s Extra Dry.....	7
Frash & Co.'s Imperial Cabinet.....	8
 Total	 27
Average	6 $\frac{3}{4}$

IMPORTED CHAMPAGNES.

Moët & Chandon.....	41 $\frac{1}{2}$
Veuve Clicquot.....	43
Pommery & Greno.....	43 $\frac{1}{2}$
Piper Heidsieck.....	44
Mumm's Extra Dry.....	45
 Total	 217
Average	43 $\frac{3}{4}$

AMERICAN CHAMPAGNES.

White Top.....	46 $\frac{1}{2}$
Cook's Imperial.....	47
Great Western	48
Golden Seal.....	48 $\frac{1}{2}$
Le Grand Monarque.....	49
 Total	 239
Average	47 $\frac{1}{2}$

As the effervescence in each bottle ceased, I shook them to secure, if possible, a continuation, but without success. The gas in each instance had completely evaporated.

At the finish of the test, or after fifty minutes had elapsed from the time of uncorking the first bottle, the thermometer on top of the steam radiator registered 98°.

The tinfoil was first removed from the neck of each bottle, and the wires securing the corks were cut from all the bottles before withdrawing the corks, so that there was no appreciable difference in time in the uncorking.

The American champagnes were uncorked first, then the imported champagnes, then the carbonated wines. One hour and five seconds were consumed withdrawing the corks.

It will be seen from the above results that the capacities of the various wines to retain their effervescence averaged:

In the carbonated wines, six minutes forty-five seconds.

In the French champagnes, forty-three minutes twenty-four seconds.

In the American champagnes, forty-seven minutes forty-eight seconds.

These tests were made in the presence of Col. Edwin B. Hay, attorney and counsellor at law and handwriting expert of Washington, D. C., and James B. Green, attorney and counsellor at law of Washington, D. C.

I delivered to Prof. H. W. Wiley, chief chemist Agricultural Department, for analysis, samples of wine, viz:

Imported champagnes: Mumm's Extra Dry, Pommery & Greno, Moet & Chandon.

American champagnes: Golden Seal, White Top, Great Western, Le Grand Monarque, Cook's Imperial.

American carbonated wines: Werner & Co.'s Extra Dry.

I have the honor to be, very respectfully,

DUNCAN B. HARRISON,

Sergeant-at-Arms Senatorial Committee on Pure Foods.

Witness:

JAMES B. GREEN.

Witness:

E. B. HAY.

Subscribed and sworn to before me this 18th day of January, 1900.

[SEAL.]

GEORGE W. BAGG,

Notary Public.

COMMITTEE ON MANUFACTURES, UNITED STATES SENATE,
Washington, D. C., January 20, 1900.

TESTIMONY OF DR. WILLIAM M'MURTRIE.

Dr. WILLIAM MCMURTRIE, sworn and examined:

The CHAIRMAN. Please state your residence.

Dr. McMURTRIE. I live at 101 West Eighty-first street, New York City.

The CHAIRMAN. What is your profession?

Dr. McMURTRIE. I am a chemist.

The CHAIRMAN. How long have you been of that profession?

Dr. McMURTRIE. I have been in that profession twenty-nine years—since 1871.

The CHAIRMAN. Where did you take your course of study?

Dr. McMURTRIE. I was graduated from Lafayette College, at Easton, Pa., in 1871, with the degree of mining engineer. In pursuance of the course leading to that degree I gave special attention to the study of chemistry and devoted some time to post-graduate work in that department of science. In 1875 I received from the college the degree of doctor of philosophy for work done in chemical investigation. In

1872 I was appointed assistant chemist in the Department of Agriculture, and in 1873 was advanced to the post of chemist in chief.

The CHAIRMAN. Do you mean the Department of Agriculture of the United States Government?

Dr. MCMURTRIE. Yes. I held that office until the end of 1877, when I was appointed agent and representative of the United States Department of Agriculture at the Paris Exposition of 1878. I was likewise appointed superintendent of agricultural products in the United States section of that exposition.

In connection with my work there I had directions to make a special study of chemical technology as applied to agriculture, and on my return to this country I was further associated with the Department of Agriculture in preparing reports upon agricultural technology, and particularly as regards the production of sugar, wine, olive oil, and silk, as practiced in Europe. I was likewise appointed to represent the Department of Agriculture at the international exposition of sheep, wool, and wool products held in Philadelphia in 1880, and to make a study of and report upon the physical properties of wools.

While that work was in progress I was called to the chair of chemistry in the University of Illinois, in 1882, and was connected with the university as professor of chemistry until 1888. During this period I was likewise chemist to the agricultural experiment station then first established in the State of Illinois. I was likewise consulting chemist to the State board of agriculture and to other boards of the State.

In 1883 I received from the Government of France the decoration of Chevalier du Mérite Agricole, as the certificate stated, for service rendered to agriculture.

In 1895 I was vice-president for the section of chemistry of the American Association for the Advancement of Science, and was for three years chairman of the New York section of the American Chemical Society. I am now president of the American Chemical Society.

During the past twelve years I have been consulting chemist of the New York Tartar Company, and am now employed in that capacity also by the Royal Baking Powder Company.

The CHAIRMAN. What is the business of the New York Tartar Company?

Dr. MCMURTRIE. The manufacture of cream of tartar. I am consulted likewise by the Tartar Chemical Company, similarly engaged. I am consulted by other corporations and individuals on various questions relating to the applications of chemistry in commerce and the industries.

The CHAIRMAN. I desire to direct your attention to the question of baking powders. This committee is investigating and wants evidence as to all foods that are believed to be deleterious to public health, and those that are simply sophisticated and sold in fraud of the purchaser. And upon the question of public health I desire to direct your attention to the question of baking powders, particularly as to the two classes, the alum and the cream of tartar baking powders. You say you are now consulting chemist of what baking powder companies?

Dr. MCMURTRIE. The Royal Baking Powder Company, the Cleveland Baking Powder Company, and the Price Baking Powder Company all engage me at the present time in that capacity.

The CHAIRMAN. Those three are engaged in manufacturing what kind of powder?

Dr. MCMURTRIE. What is known as the cream of tartar baking powder.

In their manufacture of the cream of tartar, by the companies named, every effort is made to secure a finished product of the highest purity. And I know, from personal observation in connection with their work, that they have secured results which constitute a triumph in the chemical industry. I have seen the product issue from their works in quantities amounting to tons at a time, which, when it has gone through the ordinary processes of washing and drying, and has been subjected to tests, has shown such exceptional purity that the results obtained with 1.88 grams of the material would vary from 100 per cent by not so much as would be indicated by one drop of one-fifth normal alkali solution. This, while it may not be so clear to the lay mind, is something that will be accepted by the professional chemist as being very remarkable. The two cream of tartar manufacturers follow practically the same processes and obtain similar results.

The CHAIRMAN. One of those was the factory where Dr. Wiley got samples?

Dr. McMURTRIE. Dr. Wiley obtained in my presence samples of cream of tartar such as described and made in exactly the way indicated.

The sample which Dr. Wiley obtained was taken from a batch which amounted to probably so much as 2 tons, which constituted the result of a single operation; and while I do not know absolutely, I may say from experience with regard to such material that it will not vary appreciably from a test of 100 per cent.

That is the kind of material which is used in the manufacture of baking powders by the companies I have named. They have made the struggle to secure material of this high grade of purity, and they have forced the manufacturers of the other ingredients used in their product to supply them with materials of the same high degree of purity, and as a consequence their product leaves nothing to be desired in the way of purity, of healthfulness, and of wholesomeness.

Senator FOSTER. They make only one grade of the article?

Dr. McMURTRIE. Only one grade of baking powder—the highest attainable.

I may say with regard to the reaction developed in the use of the cream of tartar baking powder in the production of bread that the cream of tartar, which is the acid constituent reacting with the bicarbonate of soda, or baking soda, which is the alkaline constituent, liberates from the bicarbonate of soda carbon dioxide, or carbonic acid, in the form of gas, and leaves as a residue in the bread sodium potassium tartrate.

This compound, when it enters the animal system, particularly the human system, with food, is disposed of in the process of digestion in exactly the same way as other vegetable substances of like character, and is digested in exactly the same way as sugar.

The tartaric-acid radical is broken up into carbonic acid and water, in the same way that sugar is broken up. The alkaline radical takes part in the process of assimilation; it passes into the blood, supplying the necessary alkaline constituents thereof; it is eliminated by the kidneys in the normal exercise of their functions, and it tends, therefore, to correct any unfavorable acidity which may occur in the fluids of the body.

I am stating this fact rather as a chemist than as a physiologist, although it is accepted by the highest and best medical and physiological authorities of the world. The quantity of the tartrates which may be ingested thus in food is of course somewhat variable, but the

amount which is found in the ordinary loaf of bread made with cream of tartar baking powder will be equivalent to about that contained in a pound and a half of good ripe grapes. And it would seem, therefore, that no further statement would be needed regarding the healthfulness and wholesomeness and value of such a substance as a food product.

If, on the other hand, we pass over to the other classes of baking powders, we find that there are two or more, but that which is most widely distributed in the markets of the United States has for its acid constituent alum of one kind or another.

In the markets of the United States and of the world we find principally three of the alums which have been used for such purpose. The first is known as potassium alum, which the chemists recognize and name as the double sulphate of aluminium and potassium; second, ammonium alum, which is known by the chemists as the double sulphate of aluminum and ammonium, less expensive than the first; and the soda alum, or double sulphate of aluminum and sodium, less expensive than either.

The last-named compound is that now most largely used in the manufacture of alum baking powder. It is rarely offered even to the manufacturers of baking powder as alum, and by many of the manufacturers of the cheaper grades of baking powder is not known as such at all. It is labeled, offered, and billed generally, and most largely, as "C. T. S.," which are the initials for "Cream of tartar substitute." It is offered to manufacturers who do not employ chemists; who themselves have no knowledge of chemistry; who have no opportunity to know what is the composition and value of this product except as it is declared to them by the manufacturer.

The manufacturers of alum baking powder, as a rule, know nothing of the strength of this product, and the larger proportion of these manufacturers will admit that in their manufacture they are guided entirely, regarding its strength and use, by the manufacturer of the product; that they are told that this has the capacity to neutralize and use up so much baking soda or bicarbonate of soda, and in accordance with such direction they use it in the manufacture of their powders.

Now, this is true with regard to this substance, that in order to have a product which corresponds exactly with the theoretical composition of sodium aluminum sulphate the greatest care must be exercised in the manufacture.

The alum is produced by making, first, aluminum sulphate. This is done by treating a mineral known as bauxite, after it has been properly heated to render the iron compounds insoluble, with sulphuric acid (oil of vitriol). The solution thus obtained is brought, by evaporation, if necessary, to the proper concentration of density, and it is then mixed with a solution of soda, made frequently and perhaps generally from salt cake, a refuse or by-product from the manufacture of muriatic acid.

The solution obtained, containing now the aluminum sulphate and the sodium sulphate, when brought to the proper degree of concentration, is, hot or warm, inclosed in proper vessels, in which it is allowed to cool. During cooling crystallization ensues, and the two substances put into the solution crystallize together, forming what is known as soda alum.

This alum is made up not only of these two constituents, but its crystallization requires that it shall take up a considerable quantity of water (we call it water of crystallization) necessary to the forma-

tion of the crystal. To get rid of this water of crystallization, the manufacturer, after breaking up the crystals, subjects them to heat; the water is driven off and a porous mass remains, and this, because of the process through which it has passed, is known as "burnt alum."

This burnt alum, when pulverized, constitutes the alum which is used in the baking-powder manufacture. It generally happens in this manufacture that the acid constituent or acid radical of the compound is in some measure driven off by the heat required to produce the proper degree of burning, and we therefore have in the finished product uncombined or only partially saturated alumina.

It can be readily understood, therefore, that the product obtained in this way has not and can not well have a constant composition. It does not and can not well have a constant neutralizing power, as it is known—that is, its power to decompose the bicarbonate of soda when it is used in baking powder must be variable. It is readily understood, therefore, why the manufacturer of the alum should, with each lot that he sends to his customer, indicate what is its neutralizing power, and we can understand why the manufacturer of baking powder who is ignorant of these qualities must accept what the alum manufacturer tells him, and we can also readily understand why the baking powder made must have uncertain and variable composition.

This leads us, then, to the consideration of the reaction which takes place when alum baking powder is used in the production of bread.

The alum baking powder, as has been stated repeatedly to the committee, consists of a mixture of alum, which I have described, of bicarbonate of soda, or what is known as ordinary baking soda, with about 60 per cent of starch.

When this baking powder is brought into contact with water, either by itself or in admixture with flour, and the mass is cold, comparatively little action occurs. As heat is applied the alum and the bicarbonate of soda acting upon each other enter into a double decomposition. The sodium constituent of the bicarbonate of soda takes the place of the aluminum in the alum. In this action the carbon dioxide or carbonic acid is liberated, and, if we may believe what some of the chemists say, the aluminum is liberated and set free in the form of aluminum hydroxide and all of the sodium of the bicarbonate of soda is changed into the condition of sodium sulphate, which, as you will remember, is one of the constituents likewise of the soda alum.

We then have a product of this reaction, carbon dioxide, which is liberated and passes off. We have remaining in the bread the solid residue, namely, the sodium sulphate and an aluminum compound.

There are good authorities who believe, and with reason, that the reaction between alum and bicarbonate of soda is never complete; that it is impossible for bicarbonate of soda under any conditions to effect the complete decomposition of this peculiar compound of alumina, and that, therefore, particularly in the conditions occurring in the process of baking bread made with the alum baking powder, there must always remain in the finished bread a certain proportion at least of unchanged alum. Whether it exists as unchanged alum or as a peculiar basic compound of aluminum is indifferent, because when these indeterminate substances, together with the aluminum hydroxide which is undoubtedly produced, are brought into contact or admixture with weak acids they are properly brought into solution; in fact, they are readily soluble in weak acids, and they produce the salts of alumina.

The salts of alumina, when in solution in presence of sodium sul-

phate, undergo a change; the constituents of all the compounds in solutions suffer redistribution, as it were, and we know that in all such redistributions all compounds that are possible from the constituents present are produced.

It is manifest, therefore, to the chemist and must be manifest to the lay mind that when aluminum sulphate produced, as it must be, in this way is in solution with sodium sulphate, these constituents exist in the solution in every respect in the same way as does soda alum in solution, and in view of the fact that the contents of the stomach in digestion contain acids of various sorts, particularly hydrochloric acid, secreted with the gastric juice, particularly lactic acid and butyric acids, almost invariably produced in the process of digestion, the conditions of solution which I have described must always exist in the stomach during the process of digestion of bread which has been made with an alum baking powder and has been digested with other food. Therefore, all of the medicinal and therapeutic influences ascribed to alum by the medical fraternity, pharmacologists, therapeutists, and physiologists must obtain in the stomach during the process of digestion of such bread made with the alum baking powder; there is no choice to intelligent men, and they must believe that this substance which is accepted by the medical fraternity to be an astringent to have an influence upon the mucous surfaces, constricting the parts, interfering with the secretion of the natural fluids through them, must be injurious to the consumer, and must be prejudicial to health.

It is said that the aluminum hydroxide in the bread is insoluble, has been rendered insoluble in the reaction occurring in the process of baking, and it has been denied that alum or any soluble alumina compound can exist in the bread.

This, however, has been proven by able chemists to be incorrect, in view of the fact that when bread which has been made with alum baking powder is extracted with cold water, the water solution evaporates and the organic matters or carbon compounds are properly destroyed, so that they may have no influence whatever upon the tests to be applied, the presence of alumina or of aluminum compounds is undoubtedly revealed when proper tests are applied.

Soluble alumina compounds and free alum, therefore, do exist in bread made with alum baking powder, and whether from the bread itself, or whether from the result of the reactions occurring in the stomach, the system must be subjected to the action of these soluble alumina compounds when such bread is consumed.

Now, whether these soluble alumina compounds are compounds of the so-called inorganic acids, such as hydrochloric acid and sulphuric acid, or whether they have been produced by the so-called organic acids, such as the lactic acid, butyric acid, and so forth, occurring in the stomach during the process of digestion, or whether they occur in combination with the products of digestion, they are in condition to act on the mucous surfaces of the digestive tract in all respects in the same way as alum, or to be absorbed from the alimentary tract into the blood and enter the circulation.

When they enter the circulation we have the word of Professor Kober, of Dorpat, Germany, the leading authority in toxicology in the world, that they are poisonous. Discussing the experimental results achieved by Dr. Siem, he declares that the alumina compounds in the blood, and practically irrespective of the combination in which they are found there, have a distinctly toxic action upon the animal

system. Not only he but others have found that when these alumina compounds are taken into the system they may be found in the principal organs, as the liver, the spleen, the kidneys, and even the brain, while Dr. Kobert indicates that the tendency of the alumina salts is particularly directed, in the brain, to the region of the medulla, which, I believe, is accepted by the neurologists to be the most sensitive part.

Dr. Kobert has further shown that these alumina compounds in their toxic action are very slow; that after introduction in the blood it often happens that no symptoms are observed for several days, when intense nervous disturbance occurs, showing that the nervous system particularly may be very decidedly affected by the introduction of those compounds.

We have been told that when these alumina compounds are ingested with the food they are entirely inert; that they pass through the alimentary tract and are thrown off with the solid excreta. It has been stated by the same authorities that even if the alumina were taken into the blood it would be excreted through the kidneys completely, and that it could therefore do no harm. But we note that these same authorities observed exceeding care to make no determination of the amounts of alumina excreted through the faeces and the urine; nor do they endeavor by such means to establish a balance between the amount of alumina or aluminum compounds ingested with the food and the amount excreted in the faeces and urine.

That analysis showed no alumina ejected or passing out through either the urine or the excrement.

The CHAIRMAN. Did you read the evidence given by Dr. Austin before the committee?

Dr. McMURTRIE. I did.

I listened carefully to the evidence of Dr. Smith and Dr. Flint in New York on that subject, upon the results of whose experiments the declarations of Dr. Austin were based; and I found that these gentlemen declared, both in the direct and in the cross examination, that they knew absolutely nothing with regard to the disposition of the aluminum compounds in the body when ingested with the food; that they knew absolutely nothing with regard to the amount of the alumina that was ingested; that they were unable, therefore, to say whether the alumina passed through the alimentary tract unacted upon and inert, whether it went into the blood and the circulation, and, if it did go into the blood and into the circulation, whether it would be wholly excreted or whether it would remain deposited in the organs as a distributing and injurious element.

When we study these various organs and their functions we learn that they exercise their functions largely by the operation of diffusion, and when we study the operation of the diffusion upon the aluminum compounds we find that while in many cases the acid radical of the aluminum compound will pass through the dialyzing membrane, the aluminum constituent will be left behind; and because of this difficult diffusibility of the aluminum compounds, they will not pass through the organs in the exercise of their functions with the same rapidity that other substances do—like the salts of potassium and sodium, for instance—but remain in these organs, and the repeated periodical ingestion of the aluminum compounds would induce such an accumulation as to interfere seriously with the proper exercise of the functions of the organs.

It has been stated by high medical authority—it was stated, I believe, by Dr. Flint in the evidence referred to—that alum exercises

an astringent influence in the human body, astringent first upon the mucous surfaces, astringent further when carried by the blood through the different organs.

It is found in the later pharmaceutical authorities in the United States, and particularly in the United States Pharmacopœia, copied from the German Pharmacopœia, that alumina—that is, the aluminum hydrate—is described as a medical agent and as an astringent.

We further know that in the dialysis of the aluminum compounds the aluminum compound left behind in the process is aluminum hydrate. It would, of course, be beyond my province to say as a physiologist that the aluminum hydrate that might be produced, for instance, in the kidneys would have an astringent and constricting action upon the cells of the kidneys; but it would seem reasonable to suppose that if aluminum hydroxide is an astringent under any circumstances, it would be an astringent then.

So that it necessarily follows that when the aluminum compounds are used as food they must have, and do have, an injurious and deleterious influence upon the system.

Furthermore, we know, as chemists, that no compound of aluminum is ever found in the natural food of either vegetable or animal origin. I may say that it is never found in any flowering plant. It has been stated that alumina compounds have been found in wheat. I believe there is only one recorded statement to that effect in all the thousands of analyses of that cereal which have been published. It was made by a chemist of Japan. To my knowledge he does not state how the wheat was harvested or how it was thrashed; whether by the modern and improved methods or by the ancient methods in which the grain is trampled out under the feet of animals on the ground; and there is opportunity for very reasonable doubt whether the alumina which he said existed in the wheat was there as a proper and physiological constituent of the wheat or whether it was adventitious and was attached to the outside of the grain and obtained from the ground.

It has been stated further that aluminum compounds exist in potable waters in quantities sufficient to be taken into account in the consideration of this question. I venture to say that in no proper potable water containing, as it should, in certain quantities at least, the carbonates of the alkalies and the alkali earths, is it possible for alumina or its compounds to exist in appreciable quantities.

It was stated by Dr. Flint, and likewise by Dr. Smith, the persons referred to by Dr. Austin in his testimony before this body, that in the examinations of bread which had been made with alum, or containing alum, it was the rule of certain public analysts of England to make a correction of a grain and a half per pound of bread, to correspond with the alumina in the water used, in determining the amount of alum which had been added; but it seems to me that if we look a little into the facts of the case it would appear that in order that the amount of alum, which they say exist in the loaf and is obtained from the natural water used in making the loaf, could be possible, we should find that in something less than a pint of water there would be at least a grain and a half of alum. Now, that pint of water weighs, as I remember it, in the neighborhood of 7,000 grains, so that we should have in this water one and a half parts of alum in 7,000 parts.

I have taken occasion to make inquiry among chemical experts who have had largely to do with the examination of potable waters in the

United States, and I have found them to declare that in all their experience in the examination of natural potable waters they have failed to find alumina in such waters in quantities exceeding one to two and never more than three parts per million; and that it could be detected only by the application of the utmost care and by the most delicate of all tests.

It has been stated, further, in the evidence which has been brought before you that the alum baking powders are so much less expensive than the cream of tartar baking powders.

The CHAIRMAN. That was one of the points made by Dr. Austin. He said there were millions of dollars saved in one State alone—I think he said \$3,000,000 in the State of Georgia. That question is not really before the committee; but it having been stated by him, it is only fair that you should be permitted to reply to it.

Dr. McMURTRIE. At least it is proper that you should be set right upon it, if that were necessary.

In the first place, consider the intrinsic value of the two classes of powders. The cream of tartar powder yields 14 per cent of leavening gas and is of undoubted healthfulness and wholesomeness. The alum powders, on the other hand, yield at most from 7 to 8 per cent of leavening gas and are unhealthful and unwholesome. Hence, as regards leavening power, the latter have only about 60 per cent of the value of the former and are worse than worthless on the score of healthfulness. The tartrate powders cost, at most, at retail 45 cents a pound, and 1 pound is equivalent in leavening power to 1½ pounds of the ordinary alum powder, or 1 teaspoonful of cream of tartar powder is equivalent to 1½ teaspoonsfuls of alum powder. We have, then, a cost of 45 cents against, say, 15 cents, if we place the price of the alum powder at 10 cents a pound. This differs widely from the ratio of \$2 to 10 cents, reckoned by Dr. Austin, and in truth the conditions become practically reversed.

The alum used in the manufacture of these cheap baking powders costs no more than 3½ cents a pound.

The CHAIRMAN. Per pound of baking powder?

Dr. McMURTRIE. No; 3½ cents a pound of the alum that is in it. For the materials it contains, the pound of baking powder costs less than 2 cents.

The CHAIRMAN. I think he said that there was a saving of something like \$3,000,000 in one State.

Senator FOSTER. In the amount of baking powder sold in one State in one year?

The CHAIRMAN. I think so.

Dr. McMURTRIE. Even taking the exaggerated figures put forth in the claims of the alum baking-powder manufacturers, this would be equal to one-third of the amount paid by consumers for all the alum baking powder made and sold annually in the whole country. The population of Georgia does not exceed 2,000,000. Therefore the gross inaccuracy of Dr. Austin's statement is too plain to render further comment necessary.

I think I have stated that after the most careful consideration, the use of alum in any form is absolutely prohibited in England, France, and Germany.

Senator FOSTER. In any quantity?

Dr. McMURTRIE. In any quantity, in any food. And this was done only after the most careful consideration of the subject and its most

thorough discussion. That discussion is obtainable by anybody who desires to look into the literature of the subject.

It has been further stated that the literature relating to the healthfulness or unhealthfulness of alum when used in food is limited; but it is readily determined, through official publications, that it has been the subject of careful consideration by the various governmental authorities; by the authorities of States; by the boards of health; by the food commissioners and by other bodies constituted for the purpose of the study of this question; and I venture to say that in no case has the use of alum in food ever been indorsed by such authorities.

There is possibly another point to which I might call your attention in this connection, which is not exactly a professional point, yet it is a point that one has constant occasion to recognize in the trade—that those who are offering baking powders made with alum are very careful that the packages which they offer shall bear no indication of the contents of the package.

The CHAIRMAN. We have had samples of them before the committee very fully. They try to make them appear in many cases to be cream of tartar, and only put "alum" on them when State legislatures compel them to put it on. That is matter of common notoriety in the trade and has been fully developed before this committee.

Senator FOSTER. This "C. T. S."—is not that rather misleading?

The CHAIRMAN. Yes.

Dr. McMURTRIE. It is intended to be so.

The CHAIRMAN. Dr. Wiley testified that in going into the grocery stores in New York, calling for and paying for cream of tartar, he received cream of tartar substitutes, and I think he said that out of half a dozen samples only one of them contained any cream of tartar at all.

Dr. McMURTRIE. His experience there may be duplicated in other States and cities.

The CHAIRMAN. Let me make an inquiry of you on another subject. We have had under discussion here the question of carbonated wines. I wonder whether in the course of your professional experience you have had any occasion to investigate the matter of wines. The American makers of wine who ferment the wine in the bottles claim that that is champagne, and that if it is not fermented in the bottle it is not champagne. On the other hand, representatives of other leading manufacturers of wine appeared here before the committee within a day or two and testified that they carbonated their wine; that they took a good wine, prepared it carefully by filtration, and then put into it a carbonic-acid gas which was imported from Germany.

Senator FOSTER. From the Apolinaris Springs.

The CHAIRMAN. From the Apolinaris Springs—gathered from the springs themselves and injected into this wine. In other words, it may be said to be artificially charged with carbonic-acid gas, or to be carbonized wine. Have you had any experience, Dr. McMurtie, in those matters which you would be willing to tell the committee?

Dr. McMURTRIE. I have made a very careful study of the manufacture of wine in France and in this country, and have given a good deal of attention to the manufacture of champagne wines. At one time I made a very careful study of the manufacture of champagne wine on its native heath, as it were, in the neighborhood of Epernay, in France. I visited there one of the oldest makers of champagne, one who had learned the art from his father, who, in turn, had learned

the art from his father, and it had come down by way of tradition, as it were.

I learned there that the wine was made in this way: The grapes from the vineyard were very carefully selected. The juice from the grapes was obtained by pressing. The clean juice was then put into vessels for fermentation. The fermentation was carried on to a certain extent until the wine maker recognized by his experience that it had gone far enough. The vessel containing the partly finished wine was then carried from an upper cellar, which had an ordinarily cool temperature, to a lower cellar, probably 50 or 60 feet underground. Here the temperature was uniform, at about 55 degrees. The fermentation, which was very active in the warmer cellar above, was reduced, practically stopped, in the cooler cellar below. Here, however, a slow fermentation goes on for some time, and is peculiar to that class of wine.

After the wine becomes clear it is put into bottles, and the slow fermentation is allowed to continue in the bottle. By very dexterous manipulation everything which may tend to cloud the wine settles to the stopper, and in the further process of manufacture I may say that in order that it may be brought down upon the stopper the bottle is each day turned a bit, jolted, until finally everything that is solid is brought against the stopper.

By very dexterous manipulation the stopper is removed and the sediment that has come to it is blown out, so that nothing but clear wine remains. Then the bottle, before it is closed, has added to it sometimes some of the finest cane sugar, if that should be necessary, and the bottle is again stoppered.

The bottles may then be removed to a warmer cellar, and here a fermentation again sets up, with the production of carbonic-acid gas or carbon dioxide, and of course the gas becomes condensed or rather compressed under the pressure that is produced by the gradual increase of its volume, and the wine therefore becomes charged. This process of fermentation is pursued most successfully by the legitimate American champagne manufacturers.

THE CHAIRMAN. Who are the legitimate American champagne manufacturers; that is, those who pursue the natural method of fermentation in the bottles.

DR. MCMURTRIE. There are, I think, five legitimate champagne manufacturers in the United States, who are making champagne wines equal to any produced in the world. They are the Pleasant Valley Company, The Brotherhood Company, Cook's Imperial Company, The Urbana Company, and the Lake Keuka Company. These companies have developed an enormous American industry through adopting the natural method of fermenting in the bottle.

Now, I believe it has been generally accepted that in this process of fermentation certain peculiar ethers are formed—possibly ethereal carbonates—which, when the bottle is opened and the pressure removed, undergo a slow decomposition, with a continuous liberation of carbonic-acid gas; and it is true that a wine that is not seriously cooled will continue this liberation of gas for a long time after it is opened, and this gives the exceedingly pleasant quality to a wine made in this way. In other words, the wine, after being opened, does not quickly become flat and dead.

If, on the other hand, the wine is produced by the quick fermentation and is cleared by the ordinary methods of producing a still wine, and the wine is then bottled and charged with carbonic-acid gas, if

the wine be strongly cooled, when it is opened it will continue to give off the gas for some considerable time. This will last as long as the wine is cold; but if the wine should become warmed at all—to the temperature of the ordinary room, say 65°—the gas is liberated very rapidly and the wine very quickly becomes flat.

I may illustrate this by an experience that I had in this cellar I have spoken of. The proprietor was very kind to me. I went to him with a letter of introduction, and he offered me the hospitality of his house. He took me through his cellars that were cut in the chalk rock—very large and spacious cellars—and as we went through we gathered samples of wine produced in different years and came back to the house well laden with these samples.

All these samples, possibly a dozen or more, were opened and tested. It seemed to me peculiar, when we were through, that the host should return the stopper to the bottle, and still more strange, as we started out to go through the vineyards again, that he should gather these bottles together and put them on the shelf in the closet, saying, "We'll try them again." I felt that we should have an opportunity to taste some rather dead wine.

Nothing further was said that day. Next morning we made a tour of the vineyards, and on coming back to the house he said, "By the way, let us try the wine again," and when he took these bottles and put them on the table it was only necessary for him to twist the stopper with his thumb a little bit to have that stopper go against the ceiling.

Now, if that had been wine that had been artificially charged with carbonic-acid gas, I venture to say that if that stopper had been returned to the bottle and the wine had been tried in a half hour after the stopper had been returned it would have required a very considerable effort to remove it. Of course we enjoy champagne because of the presence of the carbonic-acid gases liberated, because of the ethers that undergo decomposition become volatile and give to the wine its bouquet. Therefore the wine is valuable.

The CHAIRMAN. Can you produce that effect by artificial carbonizing?

Dr. McMURTRIE. That can not be produced by artificial carbonization. Therefore the artificially-carbonated wine has by no means the value, in my opinion, that the wine made by natural processes has.

I have heard it stated that the unfermented juice of the grape is offered and suggested as a valuable product, as a wine product. Of course an unfermented juice is not wine. An unfermented grape juice which is preserved by carbon dioxide under pressure, without any question in my mind, is preserved by the most desirable agent available, and I have no doubt that the unfermented juice which is preserved in this way will be—to me it would be—very much pleasanter than that preserved by the ordinary methods of pasteurization or by the use of other preservatives.

The CHAIRMAN. Of acids?

Dr. McMURTRIE. Of acids of various kinds.

The CHAIRMAN. Did you ever hear of their importing this gas from the springs in Germany?

Dr. McMURTRIE. I do not know anything about that. I should imagine that in view of the comparatively low cost of carbonic acid of very high quality in this country it would be impossible as a trade proposition to bring it in. We have in this country the carbonic acid produced either directly by compression or that which issues from the

springs, as is done in the neighborhood of Saratoga, or that which is produced by the heating or ignition of the limestone in retorts. We have also now in this country that produced from the process of fermentation in the manufacture of beer and spirits; and the carbonic acid from either of these sources would be eminently suited, I think, to any carbonating process; and it can be produced at such low cost that I doubt whether the trade would admit of the importation of the product from any other country.

The CHAIRMAN. I think that is all we desire to ask, Dr. McMurtrie, and the committee is much obliged to you.

The committee adjourned.

TESTIMONY OF DR. WALTER M. FLEMING.

Dr. WALTER M. FLEMING, sworn and examined:

The CHAIRMAN. Please state your residence and profession.

Dr. FLEMING. I reside in New York City, and am a physician.

The CHAIRMAN. Where did you take your course in medicine?

Dr. FLEMING. At the Albany Medical College, from which I was graduated in 1862.

The CHAIRMAN. For the purposes of our record, I will ask you to state, if you will, some of the societies to which you belong, without troubling you to name them all.

Dr. FLEMING. I am a member of the New York County Medical Society and of the Medico-Legal Society. I am physician to the Mutual Aid Association, and for twenty-four years have been a qualified examiner in lunacy for the superior court of the city of New York.

The CHAIRMAN. The committee desires to obtain the opinions of disinterested physicians and scientists in regard to the use of alum in baking powders. Will you kindly give us the benefit of your opinion?

Dr. FLEMING. I regard the use of sulphate of aluminum, or the alum of commerce, in baking powders, or in any way utilized for bread or any baked breadstuffs, as injurious in several ways: First, it solidifies or hardens the gluten of the flour, it impairs the digestion, it induces constipation, and excessive use of it produces visceral inflammation and enteritis, resulting in hemorrhoidal signets. It will also embarrass the genito-urinal functions, producing functional derangement of the action of the kidneys and bladder, likely to result in strangury as a sequel.

The commercial use of this drug in breadstuffs is almost criminal, and it should be condemned and expunged totally from food, even if special legislation be invoked to that end.

TESTIMONY OF DR. WILLIAM R. KERR.

Dr. WILLIAM R. KERR, sworn and examined:

The CHAIRMAN. Please state your residence and profession.

Dr. KERR. I reside in the city of Chicago, and am a physician by profession.

The CHAIRMAN. I desire to ask your opinion with reference to a subject that has come before this committee in connection with the investigation of the question of pure foods, namely, the use of alum

in baking powders. Will you please state what your opinion is on that subject?

Dr. KERR. During my professional experience, and particularly while health officer of the city of Chicago, Ill., my attention was on numerous occasions called to the use of sulphate of aluminum, or alum, in food stuffs, particularly in baking powders, and the deleterious effect of its use upon health.

From the various analyses presented for my inspection, and the results of its use upon the human system, brought to my attention, I am satisfied that it is extremely injurious. First, it impairs digestion; is an excessive irritant; produces many forms of disorders upon the digestive organs; precipitates constipation and impairs the action of the kidneys and bladder. I regard it as an insidious cumulative poison, and believe that its continued use will eventually become a menace to life itself.

I am heartily in favor of the enactment of legislation prohibiting its use and making the violation of a law to that effect a felony, punishable by fine and imprisonment.

TESTIMONY OF DR. H. A. WEBER.

The following affidavit, in the form of a letter, duly sworn to and attested, was received and ordered to be incorporated in the printed testimony:

[H. A. Weber, professor of agricultural chemistry, Ohio State University, 1342 Forsyth avenue.]

COLUMBUS, OHIO, January 15, 1900.

Hon. WILLIAM E. MASON, *Chairman,*
Washington, D. C.

DEAR SIR: In response to your message, I have the honor to submit the following opinion in regard to alum baking powder:

It is well known that alum is generally used in the manufacture of the cheap brands of baking powder to be found upon our markets. For example, during the summer of 1887 the Ohio State dairy and food commission collected 36 different brands of baking powder and submitted them to me for analysis. They were found to consist of three classes of powders. The classes and the number of brands in each class are as follows:

1. Cream of tartar baking powder	8
2. Phosphatic baking powder	2
3. Alum baking powder	20

It may be stated in this connection that the amount of carbon dioxide evolved from the third class was only about one-half of the amount evolved by the other two, so that, in order to obtain the same results, nearly twice as much alum baking powder would have to be used as either of the other two classes.

The objections to the use of alum in baking powders, from a sanitary point of view, are:

1. Baking powders containing alum introduce into our food a new element to which the human system has not been accustomed. Aluminum compounds do not occur in either the vegetable or animal matters which are the source of food for man.

2. Alum is a drug of well-known astringent property. In sufficient quantity it produces constipation, and for this reason its indiscriminate use in our food must be regarded as a menace to health.

3. Alum forms insoluble compounds with albuminoids. It precipitates the ferment necessary to digestion and makes them inactive, and is thus directly opposed to process of nutrition.

The claim that in a baking powder these deleterious properties of alum are destroyed owing to the decomposition of the alum by the sodium bicarbonate and the formation of insoluble and inert oxide of aluminum (Al_2O_3) is untenable. The result of the decomposition is not aluminum oxide, but aluminum hydroxide. $\text{Al}_2(\text{H}_2\text{O})_6$. This hydroxide is in itself a mild astringent, but it is really soluble in dilute acid and consequently in the juice of the stomach. The salt thus formed acts in all respects as the alum itself.

4. In the decomposition of the alum during the process of cooking sodium sulphate (Glauber's salts) is formed. This salt is extremely bitter and imparts its bitter taste to the food prepared by the use of alum baking powder and makes it unpalatable. Unpalatable food of any kind seriously interferes with the process of digestion, since it checks the secretion of the digestive fluids.

H. A. WEBER.

Sworn to and subscribed in my presence by the said H. A. Weber this 15th day of January, A. D. 1900.

[SEAL.]

CHARLES S. M. KRUMM,
Notary Public, Franklin County, Ohio.

The following statements were received and ordered printed with the testimony:

STATEMENTS OF DEPUTY SURG. GEN. CHARLES SMART, UNITED STATES ARMY, AND SURG. GEN. GEORGE M. STERNBERG, UNITED STATES ARMY.

SURGEON-GENERAL'S OFFICE,
Washington, D. C., January 16, 1900.

Some years ago, when on duty with the National Board of Health, I made an examination of a number of articles of food with a view to determine the prevalence of harmful adulterations. Two series of samples of each article were examined, one series derived from sources from which purity might be expected, and the other from sources which might be presumed to yield low-grade if not adulterated goods. No alum was found in 58 samples of flour, 30 of which belonged to the first series and 28 to the second; but of 18 samples of bread belonging to the second series 8 contained alum. In 12 baking powders of the first series there was no alum, but of 6 samples purchased in stores frequented by the poorer classes of the community, 5 were alum powders.

It is well known that alum is a powerful astringent, which would speedily have harmful effects if it were taken into the human system as alum. That some of it may be taken into the system in this form, by the use of alum baking powders, through carelessness in kneading, or great excess of alum in the powder, is among the possibilities to be remembered in considering this subject.

But it is well known also that the reaction which takes place between the sodium bicarbonate and the alum, in kneading the baking powder into the dough, destroys the alum by precipitating the insoluble aluminum hydrate, while some of the phosphates of the flour are

thrown down in combination with alumina. The hydrate and phosphate of alumina are considered by some to be insoluble in the gastric juices, and consequently to be inert. By others they are held to interfere with the digestibility of the bread and of other articles of food in the stomach. It is difficult to connect dyspepsia in the human subject with the use of alum baking powders, but many laboratory experiments have been performed which support the view that digestion is impaired by the presence in the stomach of the substances formed during the decomposition of the alum.

I consider that the public health would be improved by the substitution of bitartrate baking powders for alum powders, and by the exclusion of alum from bread and all bread-making materials.

No alum powder is furnished to the Army by the Subsistence Department.

CHAS. SMART,

Lieut. Col. and Deputy Surgeon-General, U. S. Army.

I concur in the views of Lieutenant-Colonel Smart as expressed above.

GEORGE M. STERNBERG,

Surgeon-General U. S. Army.

COMMITTEE ON MANUFACTURES, U. S. SENATE,
Washington, D. C., January 20, 1900.

TESTIMONY OF PROF. CHARLES EDWARD MUNROE.

Prof. CHARLES EDWARD MUNROE, sworn and examined.

The CHAIRMAN. Please state what your profession is.

Professor MUNROE. I am professor of chemistry in the Columbian University.

The CHAIRMAN. In Washington?

Professor MUNROE. Yes.

The CHAIRMAN. This committee is investigating the subject of pure foods. One branch of the subject is as to what food is so adulterated as to be deleterious to public health; the other branch relates to that class of foods that are sophisticated, cheapened, but not necessarily dangerous to public health. We wish to ask you a few questions on these subjects. Preliminarily, perhaps, it would be well, for the purposes of the record, if you would be good enough to state what your experience has been in the line of the subjects which I have indicated.

Professor MUNROE. My experience as a chemist is as follows: I was graduated as a Bachelor of Science in Harvard University in 1871; I taught chemistry in Harvard University until 1874; I was professor of chemistry at the United States Naval Academy from 1874 to 1886; I was chemist at the United States Torpedo Station and War College from 1886 to 1892; I have been professor of chemistry since that time in the Columbian University.

While at Harvard University I was engaged by the State board of health of Massachusetts in the examination of foods for adulterations. I have been engaged upon many sanitary problems. At the request of the American Public Health Association, I have made investigations upon the use of cotton-seed oil as food, and throughout my career,

although I have been a teacher of general chemistry, I have been interested in the chemistry of foods.

The CHAIRMAN. The committee has been requested to call several gentlemen of your profession or physicians to ask more particularly as to one item regarding which there has been some considerable dispute—that of baking powder. I will therefore ask you what your opinion is as to the use of alum in baking powder or for food generally?

Professor MUNROE. I am of the opinion that the most wholesome method of converting flour into bread is through the process of fermentation. I have found that the aeration of bread by that means has produced a palatable and wholesome product, as in the use of carbonic-acid gas in solution with water in the making of aerated bread, which I have eaten largely.

I regard the use of baking powders as of secondary value to that of fermentation in the raising of bread. However, the ease and readiness with which they may be employed lead to their being largely demanded for use.

I believe that in regard to the introduction of any material as a food we should be guided largely by the indications of nature and that we should not introduce a foreign body which does not appear naturally in the vegetable or animal organism.

The use of cream of tartar is indicated from the fact that the tartrates occur naturally in vegetation. The use of phosphates is indicated by the fact that phosphates occur in animal and vegetable organisms. The use of aluminum salts is not so indicated.

I have examined many hundreds, or perhaps thousands, of analyses from time to time as I have read the literature of animal and vegetable material, but rarely have found that aluminum was present in any, and in the cases in which it was present it was not shown that it was not present accidentally.

The CHAIRMAN. By aluminum you mean alum?

Professor MUNROE. I will get to that point in a moment.

This is the more remarkable in that according to the best estimates aluminum is the third element in rank in abundance of all the elements that constitute the earth, its atmosphere (its aqueous and its aerial atmosphere). As a constituent of clay and of other minerals it occurs widely disseminated through the soil in which vegetation grows, and yet nature selects calcium, iron, carbon, hydrogen, oxygen, sulphur, sodium, and potassium—quite a large number of elements—but it rejects aluminum.

Therefore I say that it has seemed to me (and in the past I have so held) that this indicates that aluminum does not properly enter into animal and vegetable organisms.

In the use of aluminum in the form of alum, which is one of the salts of aluminum, we have a substance which has been found by experiment to be poisonous. The aluminum sulphates and the aluminum acetates are mentioned in the works on toxicology as having produced a toxic effect upon the human system.

The CHAIRMAN. When you say "toxic," what do you mean?

Professor MUNROE. Poisonous. In experiments made with salts of alumina upon rabbits, pigs, and other animals, poisoning has been accomplished by the administration of about one grain per pound of the aluminum salts; that is, it is laid down in the books at fifteen one-hundredths of a gram to a kilogram of the body weighed. In these cases the aluminum compounds were soluble.

In the making of baking powders in which aluminum salts are used

it is held that the reaction between the alum and the bread soda causes the formation of aluminum hydroxide and of sodium sulphate, and that the aluminum hydroxide is insoluble, and therefore will not produce the effect of a poison.

It is well known that while this aluminum hydroxide is but slightly soluble in water, it is soluble in lactic acid and acetic acid, that is, in organic acids, some of which may occur in the stomach, having been produced during the processes of digestion, and that though the material is introduced in what is regarded as an insoluble condition, it is redissolved when it enters into the stomach. I have therefore believed that the alum product in the bread is capable under these circumstances of exerting a harmful effect. In any regard I hold that where a substance is introduced for use as an article of food which has been found to have harmful effects in any quantity, the burden of proof that in moderate and repeated doses it does not interfere with the normal operation of the human organism lies with the introducers, and that the most complete assurance should be given by them before the material is used.

That is a general statement of my views on the subject.

The CHAIRMAN. We are much indebted to you, Professor, for your attendance.

TESTIMONY OF DR. M. F. CUTHBERT.

Dr. M. F. CUTHBERT, sworn and examin

The CHAIRMAN. You are in general practice as a physician here?

Dr. CUTHBERT. Yes.

The CHAIRMAN. From what school were you graduated?

Dr. CUTHBERT. From the Columbian University.

The CHAIRMAN. You have heard the statement made here this morning by Professor Munroe?

Dr. CUTHBERT. Yes.

The CHAIRMAN. This committee has been requested to ask the opinion of some physicians and scientific men here in Washington as to the advisability of the use of alum as an article of food, or in baking powder with which to make bread. We should like to have your opinion on that subject. You have no interest in the baking-powder business, I suppose?

Dr. CUTHBERT. None whatever.

The CHAIRMAN. What is your opinion about alum as an article of food?

Dr. CUTHBERT. It is a subject that I have not studied to any particular extent nor been particularly interested in, from a chemical standpoint. But it seems to be the consensus of opinion that alum, which is used in these powders, when administered for any great length of time has a deleterious effect on the human body by its astringent properties. It is only in very large doses that it has a toxic or poisonous effect, but by the long-continued administration of a mineral astringent it is supposed to influence the digestion in anything but the best way.

The CHAIRMAN. You speak now simply as professional men frequently do, from the opinions of others that you have read and studied and also from your own knowledge of the fact that alum is an astringent?

Dr. CUTHBERT. Entirely so. My practical knowledge is limited

merely to its use as an astringent in medicine. We use it for medicinal purposes, as an astringent in hemorrhages, and other things. We know that it is an astringent. That is admitted.

The CHAIRMAN. Basing your judgment upon your own experience and consensus of opinion of men in your profession, what would you say as to the use of alum?

Dr. CUTHBERT. That its continued administration is harmful.

TESTIMONY OF DR. WILLIAM C. WOODWARD.

Dr. WILLIAM C. WOODWARD, sworn and examined:

The CHAIRMAN. Please state your profession and residence.

Dr. WOODWARD. I am a physician by profession, and hold at present the office of health officer of the District of Columbia. I reside in Washington, D. C.

The CHAIRMAN. You have no interest in this baking-powder question as to which you have heard the examination here this morning?

Dr. WOODWARD. None whatever.

The CHAIRMAN. You do not manufacture baking powder or own or hold any stock in any of the companies that do manufacture it?

Dr. WOODWARD. No, sir.

The CHAIRMAN. You have no doubt heard the questions that I propounded to the other gentlemen here this morning. I desire briefly to get the opinions of medical gentlemen upon that subject, having been requested to get those opinions for the use of the committee. I will ask you the same question that I asked Professor Munroe and Dr. Cuthbert. What is your opinion with regard to the use of alum in baking powders?

Dr. WOODWARD. I may state that I heard the testimony of Professor Munroe, and I agree with the line of reasoning laid down by him. It is a subject that must be dealt with largely theoretically. Professor Munroe is acquainted with the practical chemical aspects of the question and I am not, so that any opinion that I might express here would necessarily be based on the testimony of such men as Professor Munroe and others engaged in the same line of work as to the reactions which occur in the use of alum baking powder.

Of course it is understood that the effort of the manufacturers of these powders is that there shall be no alum as such appear in the bread—that is, that if it appears it shall appear in some more or less harmless compound, as he has stated—aluminum hydroxide. So that any statement as to the effect of alum, pure and simple—what the chemist or physician knows as alum—does not necessarily apply, although in the careless manufacture of baking powder of this sort it is possible that alum may appear in the bread.

The use of alum in large quantities is certainly causative of toxic effects—vomiting, if used in sufficiently large quantities, if vomiting be permitted; and if vomiting be not permitted, of inflammation of the stomach and intestines, and consequent death, if the dose be sufficiently large. None of these symptoms are, of course, apparent in the use of small doses, so that any conclusions as to the use of alum in very small doses must be more or less the result of reasoning rather than of actual experience.

We know that any astringent, of which ordinary alum is one, will cause a diminution of the secretion of any mucous membrane such as

lines the stomach, and therefore would cause an interference with digestion and therefore with assimilation in the human body; and when we take into consideration the fact that bread is eaten in large quantities not only by adults, who might be able to withstand such interference, but by children, I think we might safely say that the use of any such ingredient (alum, pure and simple) should be forbidden.

When it comes to its use in baking powders, the problem is more difficult. "The statement that any ingredient introduced into the organism which is not an essential part of it is harmful is of course a matter of reasoning, a matter of theory; and the most that can be said in such case is, as I think Professor Munroe has laid down, that the burden of proof should be on the other party to prove that this foreign element will not do harm.

In the presence of good substitutes and effective means of making baking powders that are free from this objection, it would seem that in the light of further evidence there should be some steps taken either to secure such evidence or forbid the use of alum in that way.

If it were a problem of doing without baking powder or using alum it would be different, but no harm except possibly the lack of cheapness would result. Of course, in the case of parents who elect to buy cheap foods, the Government has an interest—has an interest in the welfare of the children which the parents have not. So that it has an interest in the use of baking powders pending another investigation or an investigation by those interested in such products.

I will say, however, that I have never seen nor heard of any specific case in which injurious effects have been traced to the use of alum in bread or in baking powder.

The CHAIRMAN. You have had no case fall in your way in the course of your practice?

Dr. WOODWARD. Neither in my practice nor in the line of my duties as health officer or as coroner, which office I filled for a time here.

Senator FOSTER. What effect do you think would come from the continued use of alum in baking powders?

Dr. WOODWARD. If the alum were neutralized so that the resulting compounds would be the sulphate of soda and the hydroxide of aluminum, we would expect, if the quantity of sulphate of soda used were sufficient, to have some stimulation of the secretion of urine and a slightly aperient effect. In minute doses there would be no evidence of those effects that could be determined except by careful measurements. The effect of the ingestion of small amounts of aluminum hydroxide I am unable to state. They may be dissolved by the juices of the stomach and taken into the system or they may not. In either case I am unable to say what the probable effect would be.

The CHAIRMAN. It would depend upon whether the soda would neutralize the alum in making the carbonic-acid gas?

Dr. WOODWARD. Yes.

The CHAIRMAN. But if the residuum left was aluminum you would not recommend it?

Dr. WOODWARD. Well, there would be necessarily some aluminum left. We refer to alumina as hydroxide of aluminum; alum we refer to as a salt. I do not know of any definite investigation that will show the harmful effects of what is left. Chemists may be able to trace it.

TESTIMONY OF DR. W. M. MEW.

Dr. W. M. MEW, sworn and examined:

The CHAIRMAN. Please state your position, Dr. Mew.

Dr. MEW. I am chemist to the Army Medical Department.

The CHAIRMAN. That is to say, the Army Medical Department of the Government of the United States?

Dr. MEW. Yes.

The CHAIRMAN. How long have you been engaged in the profession of chemistry?

Dr. MEW. Twenty-seven years.

The CHAIRMAN. Did you practice medicine during any part of the time?

Dr. MEW. Yes.

The CHAIRMAN. You have heard the questions put to Professor Munroe and the other gentlemen here this morning. I was urged to obtain the opinions of prominent medical or scientific men in Washington upon the question of baking powders. The committee has been engaged on other subjects, and the subject of baking powder was finally reached. At the request of the manufacturers, I was anxious to obtain the opinions of a number of scientific gentlemen.

Dr. MEW. The manufacturers of the alum powders?

The CHAIRMAN. No; of the other powders. The alum powders had their representatives here—that is to say, Professor Austen was here and testified that he had been employed by them to make some scientific experiments. You have no interest, of course, in the business of baking powders?

Dr. MEW. None whatever.

The CHAIRMAN. We should like to have the opinions of unbiased gentlemen of scientific knowledge on this subject, and that is why we asked you to come before the committee. From your experience and professional knowledge, what do you say as to the use of alum in baking powders?

Dr. MEW. In general terms I should say that it is objectionable, although the proof of its being objectionable is not so apparent as it might be. There is one thing—for instance, there is the aluminum hydroxide, of which Dr. Woodward was speaking just now. It is quite uncertain whether that will ever go into solution again after getting into the stomach. Ordinarily it is practically an insoluble substance. It may, however, in the human laboratory again go into solution—possibly. If it does, it may do harm; but there is no evidence that it does. I know of no evidence that it does.

The CHAIRMAN. None has been brought to your knowledge?

Dr. MEW. None.

The CHAIRMAN. Then would you recommend the use of alum?

Dr. MEW. I would not recommend it, just on the principle that there is a possibility of its doing harm. Then, in the experiments in the physiological laboratory we find that many albuminous substances are precipitated—that is to say, products of digestion are precipitated by very minute doses of some of the products of that decomposition which goes on in the work of baking powder, the work of vesication.

Take the sodium sulphate, for instance. In artificial digestion in the test tubes and laboratory we find that a very small quantity of it will retard digestion; that salt enters largely into the products of this

change which goes on in the liberation of carbonic-acid gas. Now, that is merely a possibility. I do not say that it does so, but there is the possibility; and inasmuch as there are possibilities, perhaps probabilities, of some harm being done, it is better not to use the thing—better to use, by all odds, the tartrate powders. That would be my advice.

In the Army we have never used the alum powders at all. There has not been an attempt to foist one upon us for twenty years, because those who would send them there know that they would not pass muster.

Senator FOSTER. All alum powders would be rejected?

Dr. MEW. Yes; both for the Regular Army use and for the Commissary Department.

The CHAIRMAN. Do you think of anything further, Dr. Mew, that you would like to say to the committee?

Dr. MEW. I do not. Of course much of those points brought up are more or less hypothetical, problematical. There has been very little physiological work done upon them, and that is the ultimate analysis—the physiological test.

Senator FOSTER. You look upon it as probable that there are great exaggerations in these matters where there is so much competition?

Dr. MEW. Beyond a doubt. It may be said, too, that if there should be a little excess of alum in the compound, and it should get into the stomach in the free state, it would do harm, no doubt, as an astringent; but the chances are even that there might be an excess of that or of the other element. That they should be precisely balanced would be highly improbable.

TESTIMONY OF PROF. EMILE A. DE SCHWEINITZ.

Prof. EMILE A. DE SCHWEINITZ, sworn and examined:

The CHAIRMAN. What is your profession?

Professor DE SCHWEINITZ. I am a chemist and bacteriologist.

The CHAIRMAN. Where are you practicing?

Professor DE SCHWEINITZ. I am connected with the Department of Agriculture and have charge of the work of the chemical and bacteriological school of the Bureau of Animal Industry.

The CHAIRMAN. Then you are connected with the office of the Secretary of Agriculture?

Professor DE SCHWEINITZ. Yes.

The CHAIRMAN. How long have you been a chemist?

Professor DE SCHWEINITZ. I have made that my profession since I was a boy.

The CHAIRMAN. How long is it since you were graduated?

Professor DE SCHWEINITZ. I was graduated in the University of North Carolina and in the University of Göttingen, in Germany; I was graduated from Göttingen in 1889, I think; I will not be positive about the exact time. I came to Washington shortly after I came back from Germany.

The CHAIRMAN. You have been actively engaged in your profession ever since you were a young man?

Professor DE SCHWEINITZ. Yes.

The CHAIRMAN. How long have you been in the Agricultural Department?

Professor DE SCHWEINITZ. Since 1890, I think.

The CHAIRMAN. This committee has been for some time engaged in

investigating the subject of the manufacture of food products, and Dr. Wiley, of your Department, has been with us a good deal. I instructed the sergeant-at-arms of the committee to call in a few scientific gentlemen, physicians and chemists, to give the committee the benefit of their opinions with regard to the question of baking powders, having been requested to get disinterested witnesses in that subject. You have no connection, I suppose, with any of those baking-powder companies?

Professor DE SCHWEINITZ. None whatever.

The CHAIRMAN. Either the alum companies or the tartar companies?

Professor DE SCHWEINITZ. None whatever.

The CHAIRMAN. You have no interest in the matter one way or the other?

Professor DE SCHWEINITZ. No.

The CHAIRMAN. Please state to the committee what your opinion is in regard to the use of alum in baking powders.

Professor DE SCHWEINITZ. I have heard the testimony of both Dr. Mew and Dr. Woodward and agree generally with what they say. Theoretically, of course, I would say that alum is injurious in food, although, as already pointed out, the residue in the bread after baking is in all probability aluminum hydrate, although there may on occasion be a little aluminum sulphate, and it is a question whether or not the aluminum hydrate is dissolved by the gastric juice or the acids of the stomach. In a great many cases it certainly is not; in other cases it might be. As Dr. Mew said, so far as the physiological experiments go, there has been practically no evidence to show that alum in baking powder did any harm. But, as I heard Professor Munroe say, the burden of proof lies on the side of those who favor the use of alum. It may, however, be very much like the use of borax and boracic acid. As you know, there has been a great hue and cry made, especially by Germany, in regard to the use of borax and boracic acid in preserving meat sent abroad. As a matter of fact, the work done from a physiological standpoint has proven as conclusively as such work can prove that borax and boracic acid are perfectly harmless. At the same time, you would not recommend their use. So, theoretically, it may be said to be injurious.

The CHAIRMAN. But you say you would not recommend its use?

Professor DE SCHWEINITZ. I would not recommend its use; no, sir.

The CHAIRMAN. English firms, when ordering meat from our people, call for boraxed meat. Your opinion is that it is as healthy as salt, or what is your opinion on that subject?

Professor DE SCHWEINITZ. The most recent work done, from a physiological standpoint, has been done in Germany by a man named Liebreich; and his work has shown conclusively that there is more irritation caused by salt than there is by borax or boracic acid. Of course that would have to be verified by somebody else. You would never accept the testimony of one man on work of that sort.

The CHAIRMAN. Had you read the testimony taken before this committee, you would find that there have been some very thorough tests made. The committee is obliged to you, Professor, for your attendance.

TESTIMONY OF DR. JOSEPH TABER JOHNSON.

Dr. JOSEPH TABER JOHNSON, sworn and examined:

The CHAIRMAN. Please state your residence and profession.

Dr. JOHNSON. My residence is No. 924 Seventeenth street, Washing-

ton, D. C. I am a physician and surgeon. I have been a professor of gynecology and abdominal surgery for twenty-five years.

The CHAIRMAN. How long have you been engaged in your profession altogether, Doctor?

Dr. JOHNSON. Since 1865 here in Washington; afterwards at Bellevue, in New York City, and after that in Vienna. I am a professor in the Georgetown University.

The CHAIRMAN. I have been requested to call in some leading physicians and scientific gentlemen who are disinterested upon the question of the use of alum as a food or to be mixed in bread or baking powder. The committee will be much obliged to you if you will give us the benefit of your opinion on that subject.

Dr. JOHNSON. I am not a chemist or an expert on that subject and have never given any scientific examination to those matters, so that I can only speak from a practical standpoint.

The CHAIRMAN. As a physician?

Dr. JOHNSON. As a physician.

The CHAIRMAN. That is what we wanted; that is what we called you for.

Dr. JOHNSON. I should say from my knowledge of alum and its effects and uses that if it got into bread or baking powder and was in that way introduced into the system, its effect would be injurious. If taken in homœopathic doses I do not know that it would have very injurious effects.

The CHAIRMAN. If its use were continued in homœopathic doses, would it or would it not have an injurious effect?

Dr. JOHNSON. Its cumulative effect? If a person used a little of it, it might not do any harm unless he got a little more of it in one place than another, but its continued use would have an injurious effect upon the digestion, and would injure the powers of the stomach in the digestion of food. In its chemical action it has an injurious effect on the gastric juice, and the gastric juice is what we depend on to digest albuminous substances in the stomach. We could take arsenic or strychnine in very small doses for a short time and it acts as a tonic, but continuously it would be bad.

The CHAIRMAN. Continued in small doses it would be dangerous?

Dr. JOHNSON. It would be dangerous, yes.

COMMITTEE ON MANUFACTURES, U. S SENATE,
Washington, D. C., January 22, 1900.

The following statement was received and ordered printed with the testimony:

STATEMENT OF SURG. GEN. W. K. VAN REYPEN, UNITED STATES NAVY.

BUREAU OF MEDICINE AND SURGERY,
NAVY DEPARTMENT,
Washington, D. C., January 20, 1900.

DEAR SIR: Referring to your request for a report from this Bureau as to the deleterious effect of alum as a constituent of baking powder, I would state that there can be no question that the alums (sulphate of alumina and ammonia and sulphate of alumina and potassa) fre-

quently entering into the composition of baking powders are seriously injurious to the digestive system, producing a train of symptoms that characterize chronic dyspepsia. After all the testimony that has been before the public on this point for many years, the use of these cheap baking powders continues, and it is very evident that nothing but legislative action will do away with the evil.

Yours, very truly,

W. K. VAN REYPEN,

Surgeon-General United States Navy.

The CHAIRMAN U. S. SENATE COMMITTEE ON MANUFACTURES. .

COMMITTEE ON MANUFACTURES, U. S. SENATE,
Washington, D. C., January 25, 1900.

The following statement was received and ordered printed with the testimony:

**STATEMENT OF SUPERVISING SURG. GEN. WALTER WYMAN,
MARINE-HOSPITAL SERVICE.**

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL,
MARINE-HOSPITAL SERVICE,
Washington, D. C., January 24, 1900.

SIR: Referring to your request for an expression of opinion as to the use of alum in breadstuffs, and particularly baking powders, I have to state that alum (sulphate of aluminum and an alkali) applied locally to a mucous membrane is both astringent and irritant. It should, therefore, not be used in food products, such as baking powders, especially in view of the fact that there are other substances not injurious to health having all the necessary properties of a good baking powder.

Baking powders containing alum are not issued by the Marine-Hospital Service. The medical purveyor of the service has been instructed by the director of our hygienic laboratory, with my concurrence, to examine and refuse the purchase of baking powders and flour containing alum.

Respectfully,

WALTER WYMAN,
Supervising Surgeon-General, M. H. S.

Senator WILLIAM E. MASON,

*Chairman Senate Committee on Manufactures,
Washington, D. C.*

COMMITTEE ON MANUFACTURES.

UNITED STATES SENATE.

Washington, D. C., January 29, 1900.

The chairman submitted the following, which were ordered printed with the testimony:

AFFIDAVIT OF PROF. W. A. WITHERS.

RALEIGH, N. C., January 24, 1900.

Hon. WILLIAM E. MASON,

Chairman Committee on Pure Foods, United States Senate.

SIR: In response to your telegram I have the honor to say that examinations were made by the North Carolina agricultural experiment station, under my direction, of twenty-four samples of baking powders, which were collected in the State at Raleigh, Statesville, Durham, Henderson, and Wilmington by the representatives of the station. These samples were purchased in the open market, and no attempt was made to secure any particular brand or class of powders.

Two of the samples were tartrate powders, prepared in New York, two were phosphate powders, prepared in Rhode Island, and the remaining twenty samples contained alum. One of these was an alum, and tartrate powder prepared in Virginia and containing practically no available carbonic acid. Six samples were alum and phosphate powders, two being prepared in Maryland, two in New York, and two in Virginia. One of these contained practically no available carbonic acid, another less than 3 per cent, and another less than 4 per cent. Thirteen were straight alum powders, three being prepared in Georgia, one in Kentucky, three in Maryland, two in New York, two in North Carolina, and four in Virginia.

Based upon these experiments, it is my opinion that alum baking powders are used to a very large extent, and that their manufacture is not confined to any particular State or section.

The experiments of others indicate that the advisability of using alum baking powders is very questionable to say the least. If the alum baking powder manufacturers are convinced as to the healthfulness of their product they should not object to a law requiring manufacturers to state on each package of powder the class to which it belongs. Such a law, I believe, would be eminently proper and desirable.

Very respectfully,

W. A. WITHERS,

Chemist, North Carolina Agricultural Experiment Station.

STATE OF NORTH CAROLINA, Wake County:

Personally appeared before me W. A. Withers, chemist of the North Carolina Experiment Station, and made oath that the foregoing statements (two pages) were true to the best of his knowledge and belief.

Witness my hand and seal this 24th day of January, A. D. 1900.

SEAL.]

J. M. FIX,
Notary Public.

STATEMENT OF DR. H. B. CORNWALL.

[From a publication issued by the American Grocer Publishing Company, 143 Chambers street, New York City, verified by a letter from Dr. Cornwall to the chairman of this committee.]

More evidence against the use of alum in baking powders might have been presented, but would have been of a similar nature to that which has already been given. In the writer's opinion the presence of alum in baking powder is objectionable, since under certain conditions it may exert an injurious effect on the digestion. The effects may not be very marked in the case of any individual consumer, but that they can be induced to a greater or less extent seems to be well established.

Since it is evident that some of the alum baking powders are so prepared as to increase the extent of any injurious effect, owing to the mixture of ingredients whose combination can not be justified on any grounds, it is recommended that a special and more thorough examination of such be made with a view to preventing their manufacture.

H. B. CORNWALL, Ph. D.,
*Professor of Chemistry, Princeton, N. J., University,
Chemist for the State.*

ADDITIONAL STATEMENT OF PROFESSOR WILLIS G. TUCKER.

[From a publication issued by the American Grocer Publishing Company, verified by a letter from the professor to the chairman of this committee.]

I am of the opinion that the employment of alum in bread making, including its use in baking powders, is highly objectionable, for I believe it to be decidedly injurious when used as a constituent of food articles.

In many countries the use of alum for such purposes is prohibited by law, and sanitarians generally regard it as a fraudulent and deleterious addition to bread and as a harmful adulterant in baking powders. Liebig, Hassall, Blyth, Smith, Bell, Church, and many other chemists, sanitarians, and physiologists have condemned the use of the alum on the ground that it hardens the gluten of the flour, hindering its solution by the gastric juice, and retarding digestion.

The fact should never be lost sight of that alum is used by unscrupulous bakers solely for the purpose of giving to bread made from inferior and unwholesome flour a better appearance, and that it is employed in the manufacture of baking powder without regard to its effect, solely because it is cheap, and that since the best bread can be made without its use, and cream of tartar baking powders are infinitely better and in all respects unobjectionable, the use of alum is entirely without excuse; but, much more than this, if it is harmful, diminishing the dietetic value of the food into which it enters, and interfering with the process of digestion, as I believe it does, its use is to be severely condemned.

This is a matter of importance to all, and especially to those whose digestion is already enfeebled, as in the case of dyspeptics, for with such the use of alum preparations may give rise to grave disorders.

WILLIS G. TUCKER, M. D., Ph. D.,
*Albany, N. Y., Medical College,
Chemist New York State Board of Health.*

STATEMENT OF PROFESSOR JOHN HOWARD APPLETON.

[From a publication issued by the American Grocer Publishing Company, verified by a communication from Professor Brown to the chairman of this committee.]

I believe that the use of bread made with alum baking powder results in the introduction into the system of aluminous compounds that produce painful and serious disturbances of the digestive functions.

Of course, then, alum is altogether unsuitable and objectionable as a constituent of baking powder.

In all ordinary cases, however, the consumer is personally unable to protect himself from the insidious form of injury to which, in cases like that referred to, he may be subjected. His only recourse, as a means of defense, seems to be in statutory legislation, whereby the manufacture and sale of such deleterious articles shall be effectively forbidden.

JOHN HOWARD APPLETON,
Professor of Chemistry, Brown University, Providence, R. I.

COMMITTEE ON MANUFACTURES,
UNITED STATES SENATE,
Wednesday, January 30, 1900.

The chairman submitted the following, which were ordered to be embodied in the testimony:

STATEMENT OF MEDICAL DIRECTOR A. F. PRICE, UNITED STATES NAVY.

UNITED STATES NAVAL HOSPITAL,
Washington, D. C., January 27, 1900.

DEAR SIR: Your favor of the 26th instant at hand, and in reply I have to say that I have had no practical experience in the use of alum in baking powders, but I am decidedly of opinion that cream of tartar is relatively harmless, compared with alum.

I think that the daily use of alum, even in small quantities, would have an injurious astringent effect.

Very truly yours,
A. F. PRICE,
Medical Director, United States Navy.

W. M. E. MASON, Esq.,
Chairman of the Committee on Investigation of Pure Food.

STATEMENT OF ASSISTANT SURGEON GEORGE F. FREEMAN, UNITED STATES NAVY.

UNITED STATES NAVAL HOSPITAL,
Washington, D. C., January 28, 1900.

DEAR SIR: I consider the continued use of alum in baking powders injurious for the reason that some of the alum will remain and be taken into the stomach in a soluble form, most probably the hydrate, and being soluble in the acid secretions of the stomach will interfere with

the immediate gastric digestion, and the continued use will bring on a more chronic gastritis.

I think that the use of alum baking powders should be prohibited by law; that all baking powders should have a label certifying that they are free from alum; that the use of alum by bakers should be prohibited by law; and that any breach of the law should be punishable by a suitable fine.

Very respectfully,

GEO. F. FREEMAN,

Assistant Surgeon, United States Navy.

Hon. WILLIAM E. MASON,

Chairman Senatorial Committee on Pure Foods and

Food Adulterations, United States Senate, Washington, D. C.

JANUARY 31, 1900.

The chairman submitted the following, which were ordered embodied in the testimony:

STATEMENT OF PROF. ALFRED FAIRHURST.

LEXINGTON, KY., January 27, 1900.

DEAR SIR: Your letter requesting a statement from me with regard to the use of alum in food has been received. The pamphlet which you inclose contains, on page 10, a statement made by me several years ago. That statement is, perhaps, as good as any I can now make, and therefore I deem an additional statement as superfluous.

I am still of the opinion that the use of alum in baking powders should be prohibited by law.

Respectfully,

ALFRED FAIRHURST,
Professor of Chemistry in Kentucky University.

Hon. WM. E. MASON,

Washington, D. C.

The following is the statement referred to by Professor Fairhurst in the foregoing letter, which statement is taken from a publication of the American Grocer Publishing Company:

"The injurious effects, such as death, vomiting, constipation, etc., produced by alum and other soluble salts of aluminum, when taken into the stomach, are so familiar that I need not dwell upon them.

"Although alum in a baking powder may be decomposed during the process of making bread, still the hydrate of alumina, which is soluble in the acids of the stomach, would be formed in the bread, and this I think would be injurious to health.

"Alumina is not a constituent of the human body, nor are its compounds of any service to the body in performing its functions.

"When they are absorbed into the blood they exist there simply as foreign substances to be eliminated by the kidneys, thus throwing extra work upon them and by their irritant effects possibly causing the kidneys to become diseased.

"I regard alum in baking powder as an adulteration injurious to the public health, and therefore as a crime against the public. I believe that its use for this purpose should be prohibited by a criminal law.

"A. FAIRHURST,

"Professor of Chemistry and Physiology in Kentucky University"

STATEMENT OF PRESIDENT HENRY MORTON, OF STEVENS INSTITUTE, HOBOKEN, N. J.

DEAR SIR: In reply to your letter of the 26th, asking for my opinion as to the use of "baking powders" containing alum, I would say that though I have made many analyses of such baking powders I have not had occasion to study their physiological effects; but as a matter of information derived from the literature of the subject and the experiments of others, I am of the opinion that the use of alum in such powders is objectionable and should be prevented.

Yours, truly,

HENRY MORTON.

Hon. WM. E. MASON.

STATEMENT OF DR. C. A. CRAMPTON.

TREASURY DEPARTMENT,
OFFICE OF THE COMMISSIONER OF INTERNAL REVENUE,
Washington, D. C., January 29, 1900.

DEAR SIR: Replying to your circular letter of the 24th instant, I would say that my views upon the subject of the use of alum in baking powders may be found in Part V, Bulletin No. 13, Department of Agriculture, prepared by me, a copy of which I send you herewith.

I do not think that any testimony of value has been produced since the publication referred to, which contains a résumé of the whole subject.

My opinions as to the proper legislative measures to pursue in the regulation of the sale of baking powders are also set forth in the bulletin referred to, amounting practically to the requirement that all baking powders bear labels showing the ingredients used in the manufacture, and the amount of each ingredient. The best way to bring this about would be, in my opinion, by means of a law placing an internal-revenue tax upon such products, following the lines of the present laws governing the sale of oleomargarine, mixed flour, etc.

As the above statement is merely an expression of opinion, it seems hardly necessary to make it a sworn statement, as you request.

Very respectfully,

C. A. CRAMPTON,
Chief, Division of Chemistry.

Hon. WILLIAM E. MASON,
*Chairman Committee on Investigation of Pure Foods,
United States Senate.*

The following is the portion of Bulletin No. 13, Department of Agriculture, referred to in the foregoing letter of Dr. Crampton:

THE "ALUM QUESTION."

The literature upon the subject of the use of alum in baking powders, and upon the question as to its injurious effect upon the health of those who consume the bread made from it, is already quite extensive, and if quoted entire would fill a fair-sized volume. For the benefit of those

who may desire to make an exhaustive study of it, I will make reference to all of the articles bearing upon the subject that have come under my observation, as follows:

Alum in baking powder, by Prof. E. G. Patrick. (Scientific American Supplement No. 185, 7, p. 2940.)

Report of proceedings in the Norfolk baking-powder case (first trial). (Analyst 4, p. 231.)

Norfolk baking-powder case (second trial.) (Ibid., 5, p. 21.)

Editorial comment on the case. (Ibid., 5, pp. 13 and 34.)

On the action of alum in bread making, by J. West Knights. (Ibid., 5, p. 67.)

Cereals and the products and accessories of flour and bread foods, by E. G. Love, Ph. D. (Second Annual Report State Board of Health of New York, 1882, p. 567.)

On the solubility of alumina residues from baking powders, by Lucius Pitkin. (Journal American Chemical Society, 9, p. 27.)

Experiments upon alum baking powders and the effects upon digestion of the residues left therefrom in bread, by Prof. J. W. Mallet. (Chemical News, 58, pp. 276 and 284.)

As I have previously indicated, the matter of the physiological effect of the residues left by baking powders is not properly a chemical problem. On account of the interest and importance attached to it, however, it would seem necessary to give here somewhat of a résumé of the subject without attempting to arrive at a definite conclusion, or to settle, arbitrarily, the question as to whether the sale of certain forms of powders should be prohibited.

For a proper understanding of the alum question it is necessary to explain that the use of alum in bread making is prohibited in countries having food-adulteration laws, such as England and France. This is partly on account of its injurious effect upon the system, but principally because of its peculiar action, not yet well understood, in improving the color and appearance of the bread to which it has been added, so that a flour of inferior grade, or even partially spoiled, may be used to make bread which will look as well, to all appearances, as bread made from much better grades.

Blyth¹ speaks as follows of this use of alum in bread:

Alum is added to bad or slightly damaged flour by both the miller and the baker. Its action, according to Liebig, is to render insoluble gluten which has been made soluble by acetic or lactic acids developed in damp flour, and it hence stops the undue conversion of starch into dextrin or sugar. The influence of alum on health, in the small quantities in which it is usually added to bread, is very problematical, and rests upon theory more than observation. But notwithstanding the obscurity as to its action on the economy there can be no difference of opinion that it is a serious adulteration, and not to be permitted.

Allen² says:

Alum, or an equivalent preparation containing aluminum, is by far the most common mineral adulterant of bread, though its use has greatly decreased of late years. Its action in increasing the whiteness and apparent quality of inferior flour is unquestionable, though the cause of its influence has not been clearly ascertained. Whether there be sufficient foundation for the statements made respecting the injurious effects of alumized bread on the system is still an open question.

The following is from Hassall:³

With reference to the use of alum, Dr. Daughish has written: "Its effect on the system is that of a topical astringent on the surface of the alimentary canal, producing constipation and deranging the process of absorption. But its action in neutralizing the efficacy of the digestive solvents is by far the most important and unquestionable.

¹ Foods, Composition and Analysis, p. 168.

² Commercial Organic Analysis, 1, p. 371.

³ Food, its Adulterations, and the Methods for their Detection, p. 344.

The very purpose for which it is used by the baker is the prevention of those early stages of solution which spoil the color and lightness of the bread while it is being prepared, and which it does most effectually; but it does more than needed, for, while it prevents solution at a time that is not desirable, it also continues its effects when taken into the stomach, and the consequence is that a large portion of the gluten and other valuable constituents of the flour are never properly dissolved, but pass through the alimentary canal without affording any nourishment whatever."

The manufacturers of alum baking powders, however, claim that the hydrate of aluminum which is left in the residue is insoluble in the digestive juices, and therefore does not produce the effect which is attributed to the soluble forms of alum. Aluminum hydrate is insoluble in water, but readily soluble in dilute acids, especially when freshly precipitated. When heated it gradually loses its water of hydration, but does not part with it entirely short of a very high heat. When completely dehydrated it is insoluble even in dilute acid. It never reaches this condition in baked bread, in which the temperature probably never, in the center of the loaf, at least, exceeds 100° C.

Phosphate of aluminum is somewhat less soluble in dilute acids than the hydrate. In the Norfolk case an effort was made by the prosecution to show that the soluble phosphates contained in the ash of flour combined with the alum to form phosphate of aluminum, thus rendering them insoluble in the digestive juices, and depriving the flour of an important constituent, and considerable evidence was offered by the defense to show that this was not the case. Whether the addition to alum powders of sufficient acid phosphate to combine with the aluminum present as phosphate was the result of this discussion or not I can not say, but it is certain that most of the alum powders now met with are made in this way, so that if such a prosecution were to occur to-day the relative position of the parties would be reversed. It would be to the interest of the alum-powder makers to show that phosphate of aluminum is insoluble in the alimentary canal. The solubility of these compounds in water or dilute acids is, of course, a question readily answered by any chemist, but their solubility in the complex and various alimentary fluids, and under the conditions of natural digestion in the human body, is quite another matter. As might be expected, the testimony which has been published upon this point is of the most conflicting character. Professor Patrick, experimenting upon cats, found little or no solution of hydrate of aluminum. Professor Pitkin, experimenting with gastric juice obtained from a dog, found some solution, although he used phosphoric acid in his powder. Professor Mallet, using an artificial gastric juice, found some solution to occur, even with the phosphate, and considerably more with the hydrate. It is not difficult to find reasons for such disagreement in results, for besides the various character of the solvents used and the different conditions prevailing, it is easy to see that even if the hydrate and phosphate of aluminum were themselves entirely insoluble, more or less aluminum would escape the reaction, either from imperfect mixing of the powder in the dough or from improper proportioning of the different ingredients in the powder itself, so that it would go into the residue in the form of the original salt. With powders specially prepared, on the other hand, and very carefully mixed, and kneaded up thoroughly with the dough, it might be possible to find but a very little dissolved in the digestive fluids under certain conditions, even though the salts formed were slightly soluble in such fluids.

From the various evidence that has been produced on both sides of the question, I think the following conclusions may be safely drawn:

(1) That form of alum powder in which sufficient phosphate is added to combine with all the aluminum present is a better form, and less apt to bring alum into the system than where alum alone is used.

(2) It must be expected that small quantities, at least, of alum will be absorbed by the digestive fluids where any form of powder containing it is used.

(3) Whether the absorption of small quantities of alum into the human system would be productive of serious effects is still an open question, and one that careful physiological experiment alone can decide.

As the experiments made by Professor Mallet are the most recent on this subject, I quote here his conclusions. I may say that most of those based upon purely chemical work I can indorse, having confirmed many in my own work, but I think the evidence furnished by his physiological work is hardly sufficient to justify his conclusions as to the harmfulness of such powders.

GENERAL SUMMARY OF THE CONCLUSIONS REACHED.¹

The main points which seem to be established by the experiments under discussion are, briefly stated, the following:

(a) The greater part of the alum baking powders in the American market are made with alum, the acid phosphate of calcium, bicarbonate of sodium, and starch.

(b) These powders, as found in retail trade, give off very different proportions of carbonic-acid gas, and therefore require to be used in different proportions with the same quantity of flour, some of the inferior powders in largely increased amount to produce the requisite porosity in bread.

(c) In these powders there is generally present an excess of the alkaline ingredient, but this excess varies in amount, and there is sometimes found on the contrary an excess of acid material.

(d) On moistening with water these powders, even when containing an excess of alkaline material, yield small quantities of aluminum and calcium in a soluble condition.

(e) As a consequence of the common employment of calcium-acid phosphate along with alum in the manufacture of baking powders, these, after use in bread making, leave at any rate most of their aluminum in the form of phosphate. When alum alone is used the phosphate is replaced by hydroxide.

(f) The temperature to which the interior of bread is exposed in baking does not exceed 212° F.

(g) At the temperature of 212° F. neither the "water of combination" of aluminum hydroxide nor the whole of the associated water of either this or the phosphate is removed in baking bread containing these substances as residues from baking powder.

(h) In doses not very greatly exceeding such quantities as may be derived from bread as commonly used, aluminum hydroxide and phosphate produce, or produced in experiments upon myself, an inhibitory effect upon gastric digestion.

(i) This effect is probably a consequence of the fact that a part of the aluminum unites with the acid of the gastric juice and is taken up into solution, while at the same time the remainder of the aluminum hydroxide or phosphate throws down in insoluble form the organic substance constituting the peptic ferment.

(k) Partial precipitation in insoluble form of some of the organic matter of food may probably also be brought about by the presence of the aluminum compounds in question.

(l) From the general nature of the results obtained, the conclusion may fairly be deduced that not only alum itself but the residues which its use in baking powder leaves in bread can not be viewed as harmless, but must be ranked as objectionable, and should be avoided when the object aimed at is the production of wholesome bread.

¹Chemical News, 58, 276; also published in pamphlet form.

COMMITTEE ON MANUFACTURES,
UNITED STATES SENATE,
Tuesday, February 6, 1900.

The chairman submitted the following, which were ordered printed with the testimony:

STATEMENT OF ALBERT B. PRESCOTT.

ANN ARBOR, January 31, 1900..

DEAR SIR: In compliance with your request of January 24, 1900, I desire to present the following statement.

In testifying before your committee, when sitting in Chicago last year, I said:

At any rate, I am very sure that any baking powder containing alum, if allowed to be sold, should have the presence of the alum clearly stated on each package.

In my present judgment, it would be well to prohibit the sale of baking powders or other articles of food to which alum has been added as soon as proper legal enactments can be reached in the course of regular legislation. This judgment is based partly upon the fact that alum and other aluminum salts are inherently injurious, actually poisonous to the system, so far as they gain admission to the circulation of the blood. Exact researches upon the effect of aluminum salts when they are introduced into the blood show that they cause degeneration of nervous and other tissues, acting slowly and insidiously in their course. Some extent of solubility of aluminum compounds and some degree of their absorption into the circulation will result from the general use of alum baking powders. In the measure of the same solubility the gluten-like parts of food are hardened, and the mucous coat is treated with an astringent. If the mucous coat be abraded introduction into the circulation is greatly increased. Generally so little aluminum compound goes into solution in the stomach and so very little enters the circulation of the blood from the habitual use of alum baking powders that no observed effects are traced to this cause, nor can they easily be so traced at once. A slight addition of almost any poison can be made to food without harm being seen to come of it, as we do not see any movement of the hour hand of a clock. None the less, poisons should be legally excluded from food.

Very respectfully submitted.

ALBERT B. PRESCOTT.

Senator WILLIAM E. MASON,

*Chairman of the Committee on the Investigation
of Pure Foods, United States Senate, Washington, D. C.*

Subscribed and sworn to before me at Ann Arbor, Mich., this 31st day of January, A. D. 1900.

ZINO P. KING,
Notary Public, Washtenaw County, Mich.

STATEMENT OF DR. WILLIAM W. JOHNSTON.

FEBRUARY 3, 1900.

DEAR SIR: The chemists assert that when alum is used in bread making its action is uncertain, and that a certain amount of it often remains unchanged. If this is a fact, there can be no question of its deleterious influence.

Alum is used in medical practice to contract the blood vessels of the stomach and intestines, and to diminish the activity of the secretions. This effect when produced in a man in health necessarily interferes with digestion, and the long continuance of such effect will undoubtedly produce disease. I therefore unqualifiedly unite with those who ask for such legislation as will forbid the use of alum for this purpose.

Very respectfully,

WILLIAM W. JOHNSTON, M. D.

Hon. WILLIAM E. MASON,

*Chairman Committee on Investigation of Pure Foods,
United States Senate.*

STATEMENT OF PROF. C. F. CHANDLER.

COLUMBIA UNIVERSITY,
DEPARTMENT OF CHEMISTRY,

New York, January 30, 1900.

MY DEAR SIR: In reply to your letter of January 26, I regret that it is entirely beyond my power to comply with your request, for the reason that I am so occupied at the present moment that I have not a minute to spare. Such a statement as you ask would require some considerable time in its preparation, and the matter is too serious for a hasty or careless statement on my part. I am entirely opposed to the use of alum in baking powders, and nothing would induce me to have it used in my family, but as it is a considerable length of time since I considered the subject, I have not the facts or arguments at hand for a proper treatment of the subject.

Very truly, yours,

C. F. CHANDLER.

Hon. W. E. MASON,

United States Senate, Washington, D. C.

TESTIMONY OF PROF. S. C. BUSEY.

1545 I STREET NW.,
Washington, D. C., February 3, 1900.

Hon. WILLIAM E. MASON,

Washington, D. C.

DEAR SIR: I am such an invalid that I can not attend to any matter that requires serious effort. I am not an expert in the chemistry of foods, but from what I have learned of, and my experience with, the internal use of alum, would regard it as a seriously injurious ingredient in baking powders or food preparations of any kind, as well as in drinking water.

I would take very great pleasure in giving any information in my knowledge to promote legislation to prevent the adulteration of foods, and particularly the use of alum in baking powders or other food products, but I have no expert knowledge along such lines of information.

Yours, very truly,

S. C. BUSEY.

TESTIMONY OF JOHN C. WISE, MEDICAL INSPECTOR, UNITED STATES NAVY.

1120 VERMONT AVENUE,
Washington, D. C., February 8, 1900.

Hon. Wm. E. MASON,
United States Senate, Washington, D. C.

MY DEAR SIR: I take great pleasure in replying to your letter of January 26, in the interest of pure food, for I consider this line of investigation and legislation of incalculable importance, and in this regard our Government is much behind the advanced nations of Europe.

I can not address you as an analyst, but rather as the hygienist and physician who has had to do with the health of large bodies of boys (apprentices) and men in the naval service, where the purity of the ration issued is guarded as carefully as possible.

My experience has taught me just what is fully brought forth in the pamphlet published by your committee, viz:

First. The alum baking powders produce a heavier and more indigestible bread than those made with tartrate of potash.

Second. The injurious effect of alum on the mucous coat of the stomach is positive and beyond dispute; it is both an irritant and astringent, interfering seriously with the secretion of digestive juices.

The above facts are so unanimously asserted by medical men that specific statement seems unnecessary.

Such being the case, it is evident that the use of alum in any article of food or any article used in the preparation of food should be prohibited by law.

The writer's attention has been called to the manner of dealing with proprietary medicines in Italy, and it has seemed to him applicable as well to articles used as food or in the preparation thereof.

The article exposed for sale has its formula plainly written thereon. From time to time an officer in the employment of the Government gathers samples of the article wherever it is to be found on the market, and it is subjected to a careful analysis by a competent officer. If the contents differ materially from the formula which the article carries, then the license of the manufacturer or vender is revoked, and he is subject to fine or other punishment.

In conclusion, from an experience of thirty years in a service where the subject under consideration by your committee demands much attention, I am led to believe that the adulteration of food in the United States is much more general than is supposed. Of its deleterious effects on the welfare of our people there can be no doubt.

I have the honor to be, very respectfully, yours,

JOHN C. WISE,
Medical Inspector, United States Navy.

[Extract from testimony.]

THE EFFECT OF ALUM WHEN USED IN BAKING POWDERS, BY PROF. HENRY A. MOTTO, JR., PH. D., E. M.

It hardly seems necessary for any experiments on animals to decide a question of this nature so that the use of alum baking powders can be condemned, for a thorough scientific investigation of the subject

can lead to no other conclusion. Still, as Professor Patrick, of Missouri, conducted some elementary experiments on cats to sustain his position in stating that alum baking powders are not injurious to health, and as such experiments are interpreted by him favorably—although I hope to show, and am quite positive I will, that his experiments are most detrimental to his views and most favorable to the side which condemns the use of alum baking powders—I thought it advisable to conduct an exhaustive series of experiments on dogs in search of the truth, believing that such an investigation would meet with the approbation of the public.

It was with difficulty I found a suitable place to conduct the experiments so that the animals would not disturb the neighborhood; but through the courtesy of the commissioners of the dock department, I secured a shed on their premises, foot of Sixteenth street and East River. This shed I had completely remodeled into a suitable house, having the dimensions of about 16 by 14 by 12 feet high. Sixteen stalls were made inside, having dimensions of $3\frac{1}{2}$ by 2 by $2\frac{1}{2}$ feet. The bottom of each compartment was covered with straw, making a pleasant bed for the dogs. I then secured 16 dogs from the pound, which were all carefully examined to see if they were in perfect state of health. None but strong, healthy dogs were selected. The breed, age, food, color, and weight of every dog was carefully noted. Each dog was then consigned to a stall, and securely chained, and they all received a number, from 1 to 16. I commenced my experiments on the 9th of September, and finished December 3. My assistant was with the dogs from morning until night, and never left the animals without first securely bolting and locking the dog house. No stranger was allowed to enter the house unaccompanied either by myself or by my assistant, and the dogs never received a mouthful of food or anything else from anyone except my assistant and myself.

I will now detail the result of my experiments:

DOG NO. I.

Breed of dog, coach; age of dog, 1 year; food of dog, bread and crackers; color of dog, spotted black and white: health of dog, perfect; weight of dog, 35 pounds.

To this dog, on the morning of the 9th of September, was given 8 biscuits at 10 minutes past 8 o'clock. The biscuits were made by myself, as follows: 1 quart sifted flour; 20 teaspoons alum baking powder; 2 cups of water; 1 tablespoon of butter. Twenty-two biscuits were made, weighing 27 ounces; time of baking, twenty minutes.

At half-past 11, just three hours and twenty minutes, the dog was taken very sick, vomiting profusely; his vim and brightness of eye had departed, and he trembled considerably in his limbs.

At 4 o'clock 5 more biscuits of the same nature were given, but he would not eat them.

The next morning 8 more fresh biscuits were given him; he ate only a part of 1. During the day previous he was quite loose in the bowels, but he had now become very constipated, and it was only with great effort and pain he was able to relieve himself for several days.

On September 11, as he would not eat the biscuits alone; they were mixed with meat. This he ate, but remained very dejected in spirits and extremely constipated.

To dog No. V the same food was given. The description of the dog was as follows:

Breed, terrier; age, 9 years; health, perfect; food, crackers; color, brindle; weight, 30 pounds.

At 8.15 on September 9, 8 biscuits, made as described above, were given. At 12.15 the dog became very sick and vomited profusely. At 4 p. m. 5 more biscuits were given him, but he would not eat. He was very constipated toward night. On the following morning 8 biscuits were given him, which he ate in part during the day. In the afternoon he was very sick, vomiting at 4.30 and again at 5.45 p. m.

Experiments were next made, using only half the quantity used above of an alum baking powder.

The biscuits were made as follows: One quart sifted flour, 10 teaspoons alum baking powder, $1\frac{1}{2}$ cups of water, 1 tablespoon of butter; 27 small biscuits, weight, $25\frac{1}{2}$ ounces; time of baking, eleven minutes.

Three dogs were fed with biscuits thus made, with the following results:

	No. II.	No. IV.	No. VI.
Breed of dog	Cur.....	Spitz cur	Shepherd.
Age of dog	15 months	1 year	4 years.
Health	Perfect	Perfect	Perfect.
Food	Bread	Crackers	Crackers.
Color	Black	Yellow	White.
Weight	16 pounds	10 pounds	40 pounds.

Eight biscuits were given to dogs Nos. II and VI in the morning; in the afternoon dog No. II was very loose in his bowels and dog No. VI very constipated. Five more biscuits were given in the afternoon and eight more the following morning, part of which were eaten. Both the dogs were then extremely constipated and apparently quite sick, although they did not vomit.

To dog No. IV, in perfect health, was then given three biscuits, which were eaten at 9 o'clock. At 10.35 a. m. the dog became quite sick and vomited. In the afternoon and next morning more biscuits were given him, but he would not eat.

This demonstrates that some animals are more susceptible to the action of poisonous substances than others.

It now became necessary to know if the same effects would not be brought about by using the same quantities of cream of tartar powder. I therefore conducted a series of experiments to arrive at this point. Three dogs were experimented on. The following is a description of the animals:

	No. IX.	No. X.	No. XVII.
Breed of dog	Mongrel	Mongrel	Terrier.
Age of dog	4 years.....	10 years.....	2 years.
Health	Perfect	Perfect	Perfect.
Color	Black and white	Black and white	Black and tan.
Weight	20 pounds.....	35 pounds.....	15 pounds.

The biscuits were composed as follows: One quart sifted flour, 20 teaspoons cream-of-tartar baking powder, 2 cups of water, 1 teaspoon butter; 20 minutes baking; 26 small biscuits; weight, 27 ounces.

The biscuits given to dog No. XI were twice as large, only 12 being made instead of 26; therefore each dog was given as many biscuits as he would eat without in any way affecting them. Their bowels were

not in the least affected. Each dog ate 16 biscuits the first day, 8 in the morning and 8 at night. Dog No. X did not eat but 10 biscuits. The next day each dog ate the biscuits again with appetite. Dog No. XVII was fed four days on the biscuits, and ate same with appetite without showing any signs of sickness.

These experiments clearly demonstrate that the salts left in the biscuit when a cream of tartar baking powder is used are perfectly harmless, but when an alum baking powder is used are very dangerous, as in every case where dogs were fed on biscuits made with such powders the dogs were made very sick, causing them to vomit profusely, lose all energy, and show weakness in their limbs.

The next series of experiments were to ascertain what effect would be produced by feeding dogs with hydrate of alumina mixed in with their food, as also phosphate of alumina. To two dogs, Nos. XV and XVI, hydrate of alumina was then given.

The following is a description of the dogs:

	No. XV.	No. XVI.
Breed	Mongrel	Mongrel
Age	1 year	3 years.
Health	Perfect	Perfect.
Food	Bread	Bread.
Color	White	White and black.
Weight	18 pounds	20 pounds.

The hydrate of alumina was prepared by Professor Schedler. It was made by precipitating the alumina in alum by means of ammonia, and then thoroughly washing the same with water until the washings were perfectly free from traces of ammonia. The precipitate was then dried between blotting paper, and analyzed to ascertain the percentage of water it contained. The following is an analysis of the same:

	Per cent.
Hydrate of ammonia	12.48
Abnormal water	87.52
	<hr/> 100.00

From this analysis it will be seen that 1 ounce of the precipitate is really one-eighth ounce of hydrate of alumina, or $5\frac{1}{2}$ grains.

To dog No. XVI on the 13th of September was given 1 ounce of precipitated hydrate of alumina ($5\frac{1}{2}$ grains $\text{AL}_2\text{O}_3 \cdot 3\text{H}_2\text{O}$) mixed with meat, at a quarter past 8 in the morning. At 12.30 the dog became quite sick and vomited; at 10 minutes of 6 in the afternoon one-fourth ounce (109.2 grains) more of hydrate of alumina in meat was given to the dog, and at 20 minutes past 6 he was again taken sick and vomited. He vomited also considerable during the night, the meat being vomited up undigested. The next morning one-fourth ounce (109.02 grains) more of hydrate of alumina mixed with meat was given to the dog and he vomited a short time afterwards; he was very constipated, his last stool being quite black. At 3 o'clock 109.2 grains more were given him and he was again taken sick, vomiting and showing great weakness in his limbs. The next day at 3 o'clock he was given one-fourth ounce more of hydrate of alumina mixed with meat, when he was taken extremely sick, vomiting several times and showing great weakness in his limbs and loss of ambition, the brightness of eye having disappeared. He vomited during the night and could not be induced to eat any more the next day or the day following.

To dog No. XV was given three-eighths ounce (163½ grains) of hydrate of alumina mixed with meat. The dog was taken very sick in about two hours and vomited just two hours and fifty minutes afterwards; he also vomited profusely through the night. At 4.30 the next day one-half ounce (218 grains) of hydrate of alumina mixed with the meat was given the dog; he ate only about one-half of it. He was taken very sick a short time afterwards, vomiting and showing great weakness and restfulness. He would not eat any more after that day. It may be well to state here that hydrate of alumina is almost tasteless, and it was for this reason the dogs ate it as well as they did when mixed with meat. To two other dogs hydrate of alumina was given only once, and in each case the dogs were made sick and vomited.

To dog No. IX was given phosphate of alumina mixed with meat. The following is a description of the animal:

Breed of dog, mongrel; age, 4 years; health, perfect; food, bread; color, black and white; weight, 20 pounds.

On September 18, in the morning, 3 ounces of precipitated phosphate of alumina (containing 75 per cent of water, dried between blotting paper) was mixed with meat and given to the dog. This was eaten during the day, but the dog did not vomit, although he was evidently quite sick. The next morning 2 ounces more of the precipitated phosphate of alumina mixed with meat was given him, which was all eaten, and although the dog did not vomit, he was quite sick, showing less life than usual and his eye not being as bright.

From this last experiment it was clearly shown that the alumina in biscuits made with an alum baking powder must be, to a very great extent, in the condition of hydrate of alumina, as the phosphate, although causing the animal to feel unwell, did not make him vomit. In every case, as has been stated before, when biscuits were given to a dog made with less than seven times the quantity of an alum baking powder usually employed the dog vomited profusely and was made very sick, trembling in his knees; and this was the case when hydrate of alumina was given, even in such small quantities as one-eighth of an ounce, or 5½ grains. Experiments were then made to see if the action of hydrate of alumina in any way differed from the action of the alum itself. The following is a description employed:

	XIII.	XIV.
Breed	Terrier	Terrier
Age	2 years	2 years
Health	Perfect	Perfect
Food	Bread	Bread
Color	Black and tan	Tan
Weight	20 pounds	20 pounds

To dog No. XIII was given 2 ounces of burnt alum mixed with meat at 8.15 in the morning. The dog ate only the meat, leaving the alum untouched, with the exception of what adhered to the meat, which was much less than one-fourth of an ounce. At 9.30 he was very sick, trembling in his limbs, losing all vim and brightness of eye, and vomited. At 9.45 he vomited again. The next day some fresh meat was mixed in with the alum; when he ate part of the meat he was made very sick again, and vomited considerably. He would not eat any more after this.

To dog No. XIV 1 ounce of ammoniac alum was mixed with meat

and fed. At 8.15 only about one-eighth ounce was eaten. At 9.45 he was made very sick, the same as dog XIII, and vomited; he vomited again at 9.45 and again at 9.55, and was a very sick dog, showing no inclination to eat or play; his brightness of eye had entirely disappeared. To two other dogs alum was given with the same results. From these experiments it will be clearly seen that hydrate of alumina acts in the same manner as alum, causing the animal to vomit profusely, show great weakness in the limbs, and loss of ambition.

The next experiments conducted were to ascertain what effect the presence of alum, hydrate of alumina, phosphate of alumina, and basic sulphate of alumina had on the solvent power of the gastric juice. It was necessary, therefore, to procure some gastric juice for experiment. I therefore sent several dogs to Prof. J. W. S. Arnold, who inserted a canula in each of them. When the dogs were in a perfectly healthy condition Professor Arnold sent me some gastric juice, which was produced by tickling the lining of the stomach of the dogs with a feather or glass rod, which caused the gastric juice to flow out of the fistula into a receptacle placed underneath the dog to receive it. This and other methods were used to excite the flow of the secretion.

In conducting the experiments with the gastric juice I was greatly assisted by the friendly services of Prof. Robert Schedler. Four samples of gastric juice were received. The following are the experiments conducted with the same:

Sample No. 1.—Obtained by irritating the lining of the stomach with a glass tube, pure and free from food. The acid was determined in this sample and found to be 0.13388 per cent hydrochloric acid.

Sample No. 2.—Boiled ox heart was fed to the dog, which caused a flow of gastric juice, which was afterwards drawn off. The acid in this sample was only 0.006083 per cent hydrochloric acid.

Sample No. 3.—In 3 grains of this juice the acid was determined and found to be 0.21268 per cent hydrochloric acid.

Experiments were then made with this sample as follows:

To 3 grams of juice was added 0.0403 grams of fibrine (the fibrine was prepared by Professor Arnold from the blood of a dog), and the mixture was kept at the temperature of 95–100° F. for two hours, and of 70–80° F. for twenty-three hours. Digestion of the fibrine took place at the start, but was soon arrested, only one-fourth of the fibrine being dissolved.

To 3 grams more of the juice were added 0.500 grams of alum, and then 0.0403 grams of fibrine, and this was treated the same as in the last experiment. In this case about three-fourths of the fibrine was dissolved at the start, and then further digestion was entirely checked, although it remained in contact twenty-three hours.

These three experiments are very valuable, as fibrine is so readily dissolved. They show that both aluminic hydrate and alum can check the digestion of such an easily digested substance as fibrine. They show, therefore, how dangerous it is to introduce these two salts into our stomachs, if we do not wish to excite indigestion and dyspepsia.

Three experiments were then conducted with prepared boiled white of egg. To 3 grams of gastric juice were added 0.25 grams of albumen, and the juice was kept at 95–100° F. for two hours, when half of the egg was dissolved. Three more grams of juice were then added, when in two hours all the egg was dissolved. This showed that 100 grams of gastric juice would dissolve 4.16 grams of albumen. Leh-

mann claims it will dissolve 5 grams, and Schmidt 3.95 grams, although the latter authority states it may dissolve more.

To 3 grams more of gastric juice were added 0.25 grams precipitated hydrate of alumina (really only 0.031 grams, $\text{Al}_2\text{O}_3 \cdot 3 \text{H}_2\text{O}$), and then 0.25 grams albumen. The mixture was kept at the temperature of 95–100° F. for two hours, and in contact fifteen hours, and not a particle of the egg was dissolved.

To 3 grams more of the same juice was added 0.25 grams of alum, and then 0.25 grams of albumen, and this was likewise treated; but after fifteen hours' contact not a particle of the albumen was dissolved. These experiments were duplicated.

The albumen used in the experiments was the boiled white of egg. It was first macerated in a mortar with pure water, then dipped in a solution of 1 drop of hydrochloric acid to 2,400 drops of water. It was afterwards macerated again in the mortar with pure water, then dried between filter paper and weighed.

The three first experiments demonstrate beyond a doubt that both hydrate of alumina and alum check the digestive properties of the gastric juice and render it incapable of digesting even the most digestible substances; and the last three experiments demonstrate that the digestive power of the gastric juice is entirely destroyed by hydrate of alumina and alum, so far as dissolving the more indigestible substances, such as the boiled white of egg.

The alumina renders the pepsin entirely inactive by combining with it as organic matter and probably converting it into a species of leather, and in the stomach the lining membrane and cells are probably thus affected, thereby destroyed, or rendered incapable of performing their normal functions.

Experiments were next made with phosphate of alumina and basic sulphate of alumina.

To 3 grams of a fresh sample of gastric juice were added 0.1 gram of precipitated hydrate of alumina and 0.1 gram of boiled white of egg.

To 3 grams more of the gastric juice were added 0.1 gram of precipitated hydrate of alumina and 0.1 gram of boiled white of egg.

These two mixtures were kept between 95 F. and 100 F. for two hours, and in contact twenty-four hours, and not a particle of the albumen was dissolved in either case. These experiments were duplicated with fresh gastric juice from another dog, with the same results. These experiments show that all alumina salts interfere with the powers of digestion, having the property of rendering the pepsin inactive.

My next experiments were to ascertain whether alumina could be found in the various organs of the body if a dog was fed with hydrate of alumina. I therefore secured a dog from Professor Arnold, of which the following is a description:

Breed of dog, terrier; color, black and tan; age, 1½ years; weight, 20 pounds.

This dog had a gastric fistula through which the hydrate of alumina suspended in a water solution was introduced direct into the stomach by means of an ordinary syringe.

On the 21st of October, at 8.30 a. m., 5 ounces of precipitated hydrate of alumina and 2 ounces of meat were mixed together and given to the dog. He ate only one-third of the mixture. At 11.35 his bowels were very loose, and at 12.40 he vomited. At 12.55 he vomited profusely again, the meat coming up undigested.

At 5 p. m. one-twentieth of an ounce of hydrate of alumina suspended in solution was injected directly into the stomach. The dog vomited during the night. The next morning at 9.25 a. m. 1 ounce of hydrate of alumina was injected into the stomach and the dog was given meat to eat. He vomited at 1.30 p. m., and was very constipated; vomited at 2 p. m. and again at 2.15 p. m. At 3 o'clock 1 ounce more of the hydrate of alumina was injected. At 5 p. m. he vomited. He also vomited during the night and was very constipated. At 8.45 the next morning about 1 ounce more of the hydrate of alumina was injected. He vomited at 11.45 and again at 12.55. At 4.55 p. m. one-fourth of an ounce more of hydrate was injected, the dog vomiting during the night.

The dog now was so completely under the influence of the hydrate of alumina that I fully believe he would have died if any more alumina was injected. He was a very sick dog, trembling in his knees when he stood up, and wanting all ambition and vim. His eye was dull—all the brightness had departed. On the next morning, at 8 o'clock, I killed the dog, collected some of his blood, and took his liver for analysis. I separated from the blood by analysis a considerable quantity of alumina, as also from the liver. The silica and phosphate of lime were first removed before the alumina was precipitated.

My next experiment was on a black-and-tan dog in Professor Arnold's laboratory. I supplied Professor Arnold with freshly precipitated hydrate of alumina, and he fed the animal with the same for four days, when the dog was killed. I received the kidney, heart, and blood for analysis, in all of which I separated out alumina in large quantities. Professor Arnold examined the stomach and intestinal canal, and also analyzed the spleen and liver. His report is given below.

The next dog experimented on was also a black and tan. To this dog Professor Arnold fed precipitated phosphate of alumina (containing 75 per cent of water) mixed with meat. On killing the dog I took the spleen and liver for analysis, and separated out large quantities of alumina from them. Professor Arnold examined the stomach, etc., and also analyzed the heart.

REPORT OF PROF. J. W. S. ARNOLD.

UNIVERSITY OF THE CITY OF NEW YORK,
MEDICAL DEPARTMENT, 410 EAST TWENTY-SIXTH STREET,
New York, December 12, 1879.

This is to certify that I have supplied Dr. Henry A. Mott with a number of samples of gastric juice from the dog, the juice being pure and in the normal condition.

I have also made a number of gastric fistulae in dogs. Some of the animals I delivered to Dr. Mott; from others I obtained the juice with which I supplied him.

I fed a dog upon meat mixed with precipitated hydrate of alumina (containing much water). The amount of this hydrate of alumina given the dog was 12 ounces. I killed the animal and examined the viscera. The duodenum was highly inflamed in its upper portion. The spleen and liver, upon analysis, showed the presence of a considerable quantity of alumina. The heart, kidneys, and samples of the blood from the animal were given to Dr. Mott for analysis.

I fed another dog with precipitated phosphate of alumina (containing much water) mixed with meat, to the amount of five ounces of this phosphate of alumina. Upon killing the animal, both the stomach and the duodenum were found very much congested. Upon testing, the heart showed the presence of considerable alumina in its tissues.

Dr. Mott received portions of liver and spleen for analysis.

I also prepared microscopical slides of a dog's stomach in a healthy condition, and

of the stomach of the dog fed with precipitated phosphate of alumina in a congested condition. These I sent to Dr. Mott.

J. W. ARNOLD, A. M., M. D.,
*Professor Physiology and Histology,
 Medical Department University of New York.*

From these elaborate experiments it will be seen that both hydrate of alumina and phosphate of alumina are very injurious substances to introduce into the stomach, as these are sure to produce acute inflammation.

It may be advisable to say a few words with respect to some experiments conducted by Professor Patrick, of Kansas, on cats, with an alum baking powder.

Some biscuits were made with 3 teaspoons of alum baking powder to 1 pint of flour, equal to 6 teaspoons to 1 quart of flour. Six biscuits were baked in a batch and from 1 to 1½ were fed to a cat. After digestion had gone on a certain length of time (from twenty minutes to two and a half hours), varying in the different subjects, the cat was killed and the entire contents, not only of the stomach, but of the small intestines also, were examined for dissolved alumina. The mass was digested in water, filtered, evaporated, and ignited to destroy organic matter, extracting with strong acids, filtering, and, finally, adding ammonia hydrate. "In every case," says Professor Patrick, "a large amount of sodium sulphate was found (in solution, as was expected), and also a certain amount of hydrate of alumina undissolved." What the professor means by "a certain amount of hydrate of alumina undissolved" it is difficult to ascertain. Surely if it were undissolved he might have dissolved it by the aid of a little heat and a little more acid.

The truth of the matter is, if the filtered solution contained any alumina, it was combined with the organic matter. On ignition the alumina would be rendered insoluble. If not insoluble, where did the insoluble alumina obtained come from?

Perhaps he obtained it on the filter. This would clearly show that it was still in the stomach, not having been as yet absorbed. If this were not the case, and no alumina was found in solution in the digestive fluids, then the alumina must have been absorbed into the system, for it certainly entered the stomach through the biscuits.

Professor Patrick further states:

Now if bread is carelessly mixed with an insufficient amount of water, part of the flour (and with it the powder) remains nearly or quite dry; and, after baking, such bread would contain a certain small amount of alum.

This is certainly a very fair admission. We all know that bread is very carelessly mixed at times, as there are few who make good bread. Patrick's experiments actually prove this to be the case. He says:

To insure the entire absence of alum in the bread, the mixing must be done with plenty of water; and to effect this, I would suggest (although I do not consider it an absolute necessity) that the batter, with the powder added, be made rather thin at first, and then thickened by addition of more flour without powder.

In other words, Professor Patrick would upset the whole system of bread making so as to insure the use of an alum baking powder with safety (?).

It is certain a few intelligent cooks might be persuaded to adopt this new method, but the majority could not be persuaded to do so; or if they did, they would only do so once or twice and then fall back in their old ways, which would result in having alum in the bread.

I think we can safely discard Professor Patrick's experiments as proving anything in favor of alum baking powders, for, in my opinion, they only strengthen the view I have always taken, and which my elaborate experiments have conclusively demonstrated—that alum baking powders are most injurious to health.

It has been asserted by me that a person eating one biscuit made with an alum baking powder would suffer from the alumina salts present in it, but it is certain that persons continually eating biscuits made with an alum powder will suffer from its poisonous effects, as the alumina salts, instead of passing out of the system, accumulate in the various organs, interfering with their proper functions.

It must not be inferred from what has just been said that the amount of alumina salts present in a biscuit is so very small. The following experiment will throw some light on this subject:

	Ounces.
Sifted flour taken (1 quart)	15 $\frac{1}{2}$
Alum baking powder (2 teaspoons)	3 $\frac{3}{4}$
Lard	1 $\frac{1}{4}$
Milk	10 $\frac{3}{4}$
Weight of dough	28 $\frac{1}{2}$
Weight of biscuit (hot)	24 $\frac{1}{4}$
Loss in baking	3 $\frac{7}{8}$
Weight of biscuit (cold)	23 $\frac{1}{2}$
Loss of cooling	1 $\frac{1}{8}$

The baking took fifteen minutes. The biscuits were heavy. Another experiment was conducted, using 3 teaspoons of an alum baking powder. The biscuits produced were quite light, showing that 3 teaspoons of the powder are necessary:

	Grains.
2 teaspoons of alum powder, weighed.....	234
3 teaspoons of alum powder, weighed.....	351

The baking powder contained about 30 per cent of burnt alum.

Therefore there was introduced into 24 $\frac{1}{4}$ ounces of biscuit 105.3 grains of burnt alum, or what is equivalent to 194.21 grains of common alum.

One pound of biscuits contained alumina salts, if calculated as common alum (when 3 teaspoons of an alum powder is used), equivalent to 163 grains.

If the alumina in biscuit be calculated as hydrate of alumina, then 1 pound of biscuit would contain 54 grains.

One biscuit would contain 3 grains of hydrate of alumina. A person would eat about four of these biscuits at a meal, and would therefore introduce into his stomach 12 grains of hydrate of alumina.

I will close with presenting a letter to me from Prof. E. S. Wayne, of Cincinnati, in which he states that two families were poisoned by the use of alum baking powder.

CINCINNATI, April 10, 1879.

DEAR SIR: I have read your reports on baking powders with interest, and fully indorse all you say respecting them and their use.

I have met with two cases of poisoning here that could be traced to nothing else but alum baking powders. A Mr. Edwards, wife and children, were all made very sick by eating cakes made with it, and their symptoms were so similar to that of arsenical poison that they supposed they had been so poisoned. The case was handed to me and I found nothing in either cakes or powder but alum.

So also with the family of Mrs. W. J. Breed.

We are making efforts here to have a law passed by our legislature to prevent the use of alum in baking powders.

Respectfully yours, etc.,

E. S. WAYNE, Ph. D., M. D.

Changes which take place when Alum is used alone in Bread.

Alum.

In Flour:

Alumina.

Sulphuric Acid.

Potash.

Water.

Basic Sulphate of Alumina.

Sulphate of Potash.

In Bread.

Phosphoric Acid.

Unaltered Alum.

Phosphate of Alumina.

Changes which take place when an Alum Baking Powder is used in Bread.

Burnt Alum.

Added.

In Flour:

Alumina.

Sulphuric Acid.

Potash.

Water.

Soda.

In Flour:

Hydrate of Alumina.

Basic Sulphate of Alumina.

Sulphate of Potash.

Water.

Carbonic Acid.

Phosphoric Acid.

(If Soda is deficient.)

Phosphate of Alumina.

*Unaltered burnt Alum.**

* This has been actually demonstrated, from Prof. Patrick's experiments on rats,—in all cases where an excess of water is not first used.

THE COLUMBIAN UNIVERSITY,
DEPARTMENT OF CHEMISTRY,
Washington, D. C., February 5, 1900.

Senator WILLIAM E. MASON,

Chairman Committee on Manufactures,

United States Senate, Washington, D. C.

DEAR SIR: In response to your request to be informed as to experiments which I have made with alum baking powders, I have to state that I made three samples of bread, using materials from two different brands of alum baking powders found in the market, and from two different boxes of the same brand of alum baking powder. I made the bread from flour, distilled water, and the baking powder only, and also from these ingredients, to which salt and shortening had been added, the proportions used being as prescribed in the directions sold with the baking powders.

I digested these breads, after chopping and crushing them, in distilled water alone, or in distilled water containing from two to three parts of HC_1 in one thousand, this being about the strength of the gastric juice in man, and I placed the chyme or the juice expressed from it in dialyzers. I used dialyzers made of animal membranes, of parchment, of parchmentized paper, and I employed the bladder directly as taken from a recently killed animal, and in every case I found aluminum compounds in the dialysates from these breads made with alum baking powders.

It is generally agreed that when alum baking powder is used in making bread the residue is left in the bread in the form of aluminum hydroxide, and of aluminum phosphate where other phosphates have been previously present, and I have found that such aluminum hydroxide is soluble in hydrochloric, in acetic, and in lactic acids at ordinary temperatures, while the phosphate is soluble in hydrochloric acid.

Each of these acids are known to be present in the stomach of man during digestion. It is also held that after digestion in the stomach the food, in solution, eventually reaches the blood by osmose.

My experiments show conclusively that hydrochloric acid of the strength found in the gastric juice of man will, at ordinary temperatures, dissolve the residues left by alum baking powders in bread baked with them, and that the solutions of the aluminum compounds thus formed will pass through animal membranes by osmosis.

Very respectfully,

CHARLES E. MUNROE.

OFFICE OF THE APPRAISER OF MERCHANDISE,
Port of New York, N.Y., February 5, 1900.

Hon. W. F. WAKEMAN,

United States Appraiser.

SIR: Replying to the inclosed communication of the 23d ultimo from Hon. William E. Mason, relative to the importation of carbonic-acid gas, with request to be advised as to the quantity of this merchandise imported during the past five years, I have to state:

Carbonic-acid gas had been returned free of duty previous to the operation of the present tariff as acid used for manufacturing purposes. This provision was not made in the present tariff, nor was the

article specifically mentioned, and therefore it was returned for duty as a nonenumerated acid at the rate of 25 per cent ad valorem under the provisions of paragraph 1.

An appeal was taken to the United States Board of General Appraisers on this classification and the action of this office was sustained, the whole matter being the subject of T. D. 19134 (G. A. 4107). Since the decision has been rendered no merchandise of this character has been received here. If it is brought into the country it comes through other ports.

The records of this office do not furnish the information desired as to the quantity of this merchandise imported, as it is only returned in our record book as an acid. No specific items of particular merchandise are recorded.

Respectfully,

ALEX. HAMILL,
Assistant Appraiser, Seventh Division.

[Indorsement.]

OFFICE OF THE APPRAISER OF MERCHANDISE,
New York, N. Y., February 5, 1900.

Respectfully forwarded to Hon. William E. Mason, United States Senate, Washington, D. C., in response to his inquiry of January 23, 1900, for his information. It will be noted by Mr. Mason that the records of this office do not give the details as to quantities imported. Communication with the statistical bureau of the custom-house at this port may result in the obtainment thereof. Possibly the statistical bureau of the Treasury Department, at Washington, may furnish the information.

W. F. WAKEMAN,
United States Appraiser.

SAMPLE ANALYSES OF SOME OF THE AMERICAN STANDARD BREWERIES.

Pabst Brewing Company, Milwaukee, Wis.

	Specific gravity.	Extract.	Alcohol by weight.	Original weight.	Per cent.	Per cent.	Per cent.
					Per cent.	Per cent.	Per cent.
Bohemian	1.0233	7.27	3.06	13.16			
Century	1.0238	7.30	2.93	12.95			
Doppel Brau.....	1.0258	8	3.71	15.07			
Best Tonic.....	1.0575	15.02	.52	18.30			

Antiseptics, none

Long Island Brewing Company, of Brooklyn, N. Y.

	Alco-hol.	Ex-tract.	Sugar.	Dex-trin.	Albu-mi-noids.	Lactic acid.	Min-er-al sub-stances.	Hop ex-tract.	Origi-nal extract of beer.
Black Label	4.21	6.36	2.16	2.28	.43	.21	.28	.97	14.40
The Regal.....	4.12	6.36	2.32	1.74	.56	.24	.32	1.18	14.20
The Pale Extra.....	3.77	5.49	2.02	1.87	.36	.19	.30	.75	12.80

No antiseptics.

Anheuser-Busch Brewing Association, of St. Louis, Mo.

	Specific gravity, 14° R.	Alcohol by weight.	Extractive matter by weight.	Degree of fermentation.
		Per cent.	Per cent.	Per cent.
Pale lager.....	1.0148	3.64	5.36	56.7
Faust	1.0164	3.86	5.86	55.9
Budweiser	1.0148	3.68	5.38	56.9
Standard.....	1.0148	3.55	5.33	56.3
Dark	1.0164	3.91	5.88	56.1
Export	1.0148	3.64	5.36	56.7
Michelot	1.0144	3.30	5.11	55.5
Muenchener	1.0176	3.82	6.15	54.5
Black and tan.....	1.0272	2.78	8.10	40.3
Malt nutritre.....	1.0554	1.56	14.35	17

	Per cent.
Albuminoids.....	0.40 to 0.90
Total acid .....	.06 to .15
Ash.....	.10 to .15
Antiseptics	None.

George Ringler Brewing Company, New York City, N. Y.

	Specific gravity.	Extract of hops.	Alcohol by weight.	Original weight.
		Per cent.	Per cent.	Per cent.
Kapuziner	1.0103	7.21	3.02	13.11
Pilsner	1.0127	7.09	2.97	12.77
Real German lager beer.....	1.0235	8.35	3.37	14.55

No antiseptics.

FOREIGN ANALYSIS.

Arthur Guinness's Son & Co., foreign stout.

	Acidity.	Spirit indicated.	Extract gravity.	Original gravity.	Proof spirit.
Guinness Dublin stout.....	36	11	1,024	1,074	14

Percentage proof spirit by volume. Antiseptics, none.

Thomas McMullen & Co.'s White Label Bass ale.

	Specific gravity.	Maltose, per cent.	Dextrin, per cent.	Albuminoids, per cent.	Carbohydrates, per cent.	Alcohol, per cent.	Mineral constituents composed from salts derived from malt and hops.
McMullen's White Label Bass ale.....	1.0275	9.06	14.09	6.34	12.28	6.14	3.40

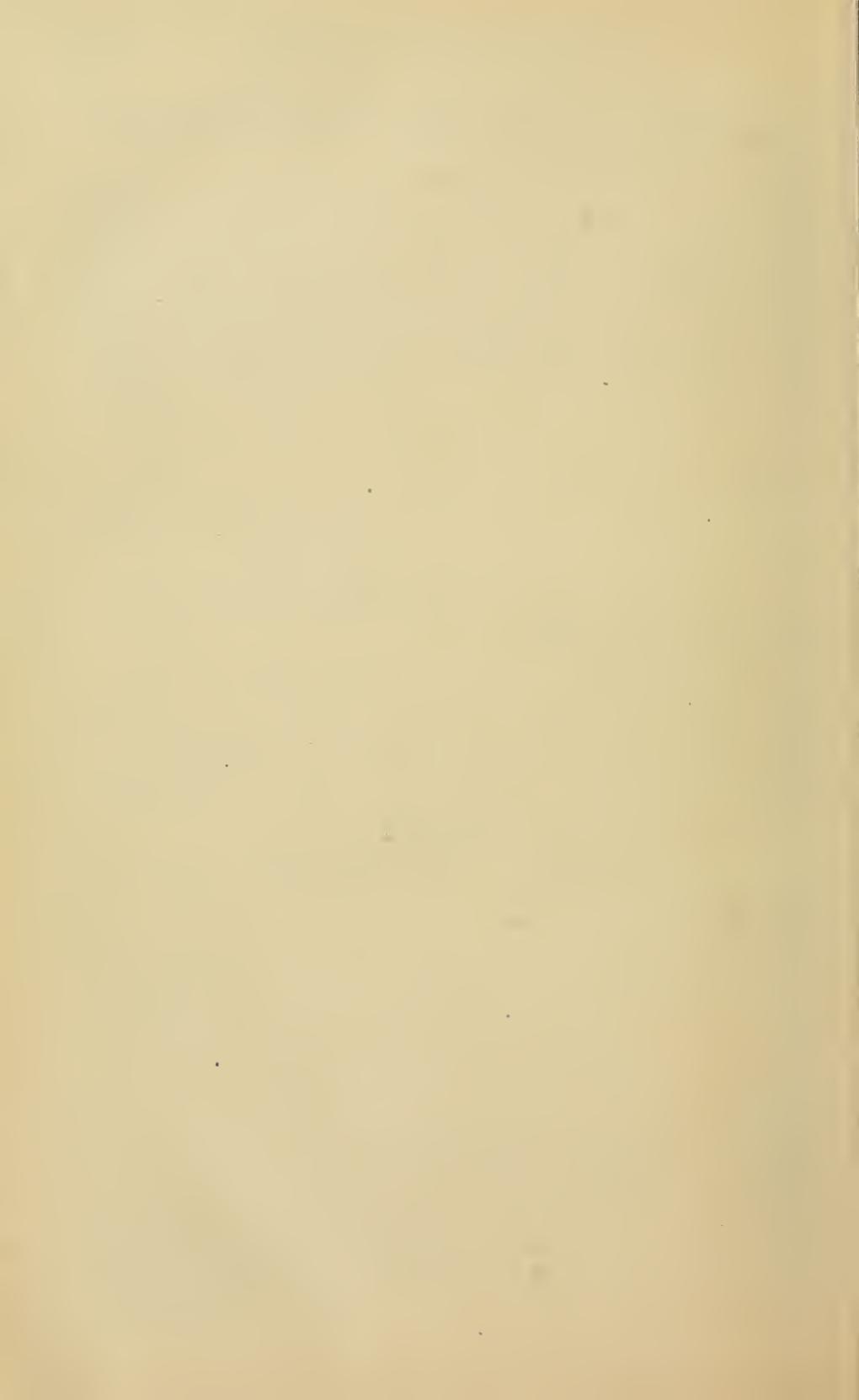
No antiseptics.

Johann Hoff's malt extract, Berlin, Germany, and New York City, United States of America.

*EISNER & MENDELSON COMPANY, NEW YORK CITY.

	Per cent.
Alcohol	4.06
Solid extract.....	10.67
Free acid .....	.225
Mineral substances.....	.316
Phosphoric acid.....	.142
Glycerin.....	.246
Original worts (by Balling saccharometer)	18.79

F P—41 -



INDEX OF NAMES.

A.

	Page.
1. Adams, H. C., commissioner of dairy and food, State of Wisconsin ..	207, 208, 209
2. Allport, Walter H., doctor, physician, and surgeon, Chicago, Ill ..	255-261
3. Ames, Howard E., surgeon, United States Navy, Washington, D. C ..	350
4. Appleton, John Howard, professor of chemistry, Brown University, Providence, R. I ..	619
5. Armour Packing Co., Chicago, Ill ..	349
6. Army, U. S., action re: to rejection alum baking powders, Washington, D. C ..	603, 604, 610
7. Arnold, J. W. S., professor, University of New York ..	634, 635
8. Atwater, W. O., professor and director Government experimental station, Washington, D. C ..	348, 349
9. Austen, Peter F., professor and chemist, New York City, N. Y ..	531, 543

B.

1. Barker, George F., professor, University of Pennsylvania ..	348
2. Bauder, De Witt, president Pleasant Valley Wine Company, Rheims, N. Y., manufacturing American champagne naturally fermented ..	513-518
3. Bauer, John, brewmaster for F. & M. Schaffer Company, New York ..	389-396
4. Begbies, Ross & Gibson, flour dealers, London, England ..	9
5. Berry, John, confectioner, Chicago, Ill ..	307-309
6. Berry, J. J., Sirup Refining Company, Chicago, Ill ..	96-102
7. Billings, Frank, physician, Chicago, Ill ..	244-250
8. Brown & Fitts, butter merchants, Chicago, Ill ..	147
9. Broadwell, Win., butter and cheese, Chicago, Ill ..	157-167
10. Broun, Heywood C., manager and importer The McMullens White Label Bass and White Label Guinness's Stout, New York City, N. Y ..	399-400
11. Brown, John W., president Long Island Brewery, Brooklyn, N. Y ..	385-389, 391-396
12. Bruce & Wilson, flour merchants, Glasgow, Scotland ..	8
13. Bulletin of Pharmacy, New York City, N. Y ..	185, 186
14. Busch, Adolph, president Anheuser-Busch Brewing Company, St. Louis, Mo ..	486-493
15. Busey, S. C., professor, Washington, D. C ..	626

C.

1. Caldwell, G. C., professor Cornell University, Ithaca, N. Y ..	348
2. Chamberlin, Pole & Co., flour merchants, Bristol, England ..	10
3. Chandler, C. F., professor Columbia University, New York City ..	626
4. Chicago Chronicle, extract from ..	349
5. Chicago Record, extract from ..	349
6. Chittenden, Russell H., professor Yale University, New Haven, Conn ..	418-426
7. Cliff, August, manufacturer of pickles and horse-radish, Chicago, Ill ..	153-157
8. Coffee Exchange, New York and Chicago ..	48, 49
9. Cook, Douglas G., president American Wine Company, manufacturing American champagne naturally fermented, St. Louis, Mo ..	518-520
10. Cornwall, H. B., professor University of Princeton, N. J ..	618
11. Cooke, Ort, manufacturer of substitute for maple sugar, Chicago, Ill ..	237
12. Craig R. Hunter & Co., flour merchants, London, England ..	10
13. Crampton, C. A., professor Division of Chemistry, Washington, D. C ..	621-624
14. Cracke, Edward, butter expert, New York City, N. Y ..	480
15. Crilly, F. J., president, New York City, N. Y ..	473
16. Cuthbert, Dr. M. F., physician, Washington, D. C ..	609, 610

D.

	Page
1. Dadie, John, manager Moxley Butterine Company, Chicago, Ill.....	325-332
2. Delafontaine, Marc, professor of chemistry, Chicago, Ill.....	229-233
3. DeSchweinitz, Emile, professor, United States Department of Agriculture, Washington, D. C.....	613, 614
4. Duff, James C., professor, official chemist New York Stock Exchange...	497-500
5. Duncan, T. C., physician, Chicago, Ill.....	47

E.

1. Eaton, E. N., professor and chemist, Chicago, Ill.....	233-236
2. Eckert, Bernard, president Swan Milling Company, Chicago, Ill	26-28
3. Edwards, Arthur R., Dr., Chicago, Ill.....	285-290
4. Edwards, William S., producer mineral waters, Chicago, Ill	238, 239
5. Eisner, Moritz, importer and manufacturer of mineral waters and Hoff's malt extract, New York City, N. Y.....	432, 433
6. Eitel, Karl, importer wine and beers, Chicago, Ill.....	290, 291
7. Ellsworth, Henry, commission merchant, Chicago, Ill.....	253-255
8. Emerson, Edward R., president Brotherhood Wine Co., manufacturing American champagnes, naturally fermented; still wines, brandies, and whiskies, Washingtonville, N. Y.....	501-508
9. English test case.....	270-276
10. English reports.....	279-281
11. Evans, Robert W., brewer, Evans's pale ale and porter, Hudson, N. Y..	416, 417

F.

1. Fairhurst, Alfred, professor, chemist, University of Kentucky, Lexington, Ky.....	620
2. Faulkner, William F., confectioner, Chicago, Ill.....	302, 303
3. Fecker, Ernest, jr., manager United States Brewing Company, Chicago, Ill.....	297-299
4. Fischer, Israel F., representing wholesale liquor dealers, New York City.	470-473
5. Fleming, Walter M., physician, New York City, N. Y.....	604
6. Frear, William, professor, State College, Pennsylvania.....	480-484, 525-531
7. Freeman, George F., surgeon, United States Naval Hospital, Washington, D. C.....	619-620
8. Furbay, H. G., representing Hazel Pure Food Company, Chicago, Ill ..	60-63

G.

1. Gallagher Augustine, publisher, revenue agent, enforcing mixed-flour law, Chicago, Ill.....	1-7, 135
2. German Association report.....	276-279
3. Grippeling Zee, flour merchant, Amsterdam, Holland.....	11
4. Green, James B., attorney at law, Washington, D. C.....	592
5. Grocer Leader, extracts, Chicago, Ill	269, 270
6. Guinness, Arthur, Son & Co., limited, manufacturers Guinness Stout, St. James Gate, Dublin.....	544-547
7. Gunther, Charles F., confectioner, Chicago, Ill.....	303-307

H.

1. Hachemeister, Henry, treasurer George Ringler Brewing Company, New York City.....	415, 416
2. Haines, Walter S., professor, Rush Medical College, Chicago, Ill.....	283-285
3. Hallberg, C. S. W., professor, Chicago University, Chicago, Ill ..	79-87, 102, 103
4. Hamill, Alex., assistant appraiser, New York City.....	639
5. Hanes, C. F., salesman Battle Creek Health Food, Chicago, Ill.....	261-264
6. Hanney, P. M., manufacturer foods, Chicago, Ill.....	58, 59, 60, 63, 64
7. Hart, Herbert W., specialist on foods, New York City.....	362-367
8. Harrison, Duncan B., sergeant-at-arms	590, 591, 592
9. Hay, Col. Edwin B., attorney at law, Washington, D. C.....	592
10. Havemeyer, Henry O., president American Sugar Company	465, 466, 467
11. Heller, Albert, manufacturer food products and preservatives, Chicago, Ill	149, 150, 171-185, 186
12. Henrotin, Dr. Fernand, Chicago, Ill	264, 265
13. Henshaw, M. W., Chicago, Ill	265, 266

	Page.
14. Hildreth, Walter E., president Urbana Wine Company, manufacturing American naturally fermented champagne, still wines, and brandies, New York City, N. Y.	508-513
15. Hochstadter, Sigmund, wholesale dealer liquors, New York City, N. Y.	467-473
16. Hobbs, John F., editor National Provisioner, New York City, N. Y.	495, 496
17. Hils, Dr. Joseph, Woonsocket, R. I.	350
18. Hupfel, I. Christian G., brewer, New York City, N. Y.	378-380, 382-385, 391-396

I.

1. Iarek & Meyer, merchants, flour, Hamburg, Germany	10, 11
--	--------

J.

1. Jackson, James, representing Fruit Importers' Union, New York, N. Y.	473
2. James Arthur & Co., flour merchants, Bristol, England	9, 10
3. James, Frank L., professor and editor, St. Louis, Mo.	266-281
4. Janssens, Eugene M., merchant, flour, Antwerp, Belgium	9
5. Jarvie, James N., merchant, representing Arbuckle Company, coffees and sugars, New York and Brooklyn, N. Y.	428-430
6. Jelke, John F., manufacturer oleomargarine, Chicago, Ill.	332-335
7. Jenkins, Edward H., professor, department of agriculture, State of Connecticut	448-455
8. Johnston, Dr. William W., Washington, D. C.	625, 626
9. Johnson, G. W., editor Petit Journal, Brussels, Belgium	360, 361
10. Johnson, Jos. Taber, professor of surgery, Washington, D. C.	614, 615
11. Johnson, S. W., professor, Yale College, New Haven, Conn	348
12. Jolles, Adolph, professor, Vienna, Austria	348

K.

1. Kerr, Dr. William R., ex-health officer, Chicago, Ill.	604, 605
2. Kressler, Frederick, brewmaster for Jas. Everard Brewery, New York City	376-378
3. Kruger, Gustav, flour merchant, Hamburg, Germany	11
4. Knight, C. Y., editor Pure Food Journal, Chicago, Ill.	137-146

167-171, 242-244, 250-252, 344-350

L.

1. La Touche, Christopher Digges, managing director, Arthur Guinness, Son & Co., limited, Dublin, Ireland	544-547
2. Lewis, Giles I., wholesale druggist, Chicago, Ill.	33-39
3. Liebmann, Joseph, brewer, Liebmann's Brewery, New York City	393-396
4. Liebriech, C., Prof., Berlin, Germany	279
5. Lippe, Henry J., president Elias Brewing Company, New York City, N. Y.	380-385, 391-396
6. London Lancet, extract	47, 48
7. Luce, Goter, flour merchant, Bremen, Germany	8
8. Luchsinger, Mathieu, flour merchant, Amsterdam, Holland	9
9. Lunham, Robert T., packer, Chicago, Ill.	239-242

M.

1. Mallet, John William, Prof., University of Virginia	549-556
2. Marine-Hospital Service, action re: to rejection alum baking powders	613
3. McMurtrie, William, Prof., consulting and analytical chemist	592-604
4. Meeson, W. M., flour merchant, London, England	8
5. Mew, W. M., Prof., chemist, Army Medical Department United States, Washington, D. C.	612, 613
6. Miller, W. E., manager butterine department, Armour Co., Kansas City, Mo.	322-325, 348
7. Minor, John C., jr., manager Carbonic Acid Gas Co., New York City	573-576
8. Mitchell, A. S. Prof., chemist Dairy and Food Commission State of Wisconsin	106-133
9. Moore, Herman F., bee hiver, Park Ridge, Ill.	217-220

	Page.
10. Morris & Co., flour merchants, London, England	8
11. Morton, Henry, president of Stevens Institute, Hoboken, N. J.....	11, 621
12. Monred, J. H., expert dairy products, Winnetka, Ill.....	64, 65
13. Mowat Brothers, flour merchants, Glasgow, Scotland	9
14. Moxley, Wm. J., butter expert, Chicago, Ill	146-149
15. Monroe, Chas. Edwd., Professor of Chemistry Columbian University, Washington, D. C	607, 608, 609, 638
16. Murray, Allen, drug and spice milling, Chicago, Ill.....	66-73
17. Mott, Henry A., Professor, New York City, N. Y.....	627-634

N.

1. National Provisioner, New York City.....	349, 350
2. Navy, U. S., Action re. to rejection Alum Baking Powders	612, 613
3. North, J. A., exporter of butter, New York City.....	475-480

O.

1. Oeline, Theodore, president Conrad Seipp Brewing Company, Chicago, Ill.	293-297
2. O'Reilly, J. Fanning, editor Liquor Trades' Gazette, New York City.....	460-465

P.

1. Pabst, Captain Fred., president Pabst Brewing Company, Milwaukee, Wis	311-313
2. Petraens, C. V., Prof., Chicago, Ill	291-293
3. Piffard, Henry G., Dr., food expert, New York City	187-195
4. Pirring, Henry C., manufacturer butterine, Columbus, Ohio....	313-322, 338-340
5. Plautz, C. Herman, secretary United Brewing Company, Chicago, Ill ..	300, 301
6. Prescott, Albert B., professor University of Michigan, Ann Arbor, Mich.	195-201,
	625
7. Price, A. F., medical director U. S. Naval Hospital, Washington, D. C.	619
8. Pole, Chamberlin & Co., flour merchants, London, England.....	10
9. Pollak, Richard, butterine merchant, Chicago, Ill	152, 153
10. Potter, W. C., manager butterine department, Swift & Co., Chicago, Ill.	335, 336

R.

1. Ried and Glasgow, flour merchants, Liverpool, England.....	8
2. Rew, George C., manager Calumet Baking Powder Company, Chicago.....	87-89, 104-106
3. Rheinstorm, Isaac, distiller liquors and cordials, New York City	427
4. Ripen, Benjamin, manufacturer artificially carbonated champagnes, New York City.....	569-573
5. Roche, Edward G., bottler McMullen's White Label Bass Ale and White Label Guinness's stout, New York City	413, 414
6. Rogers, William J., secretary Borden's condensed milk.....	439-444
7. Rossati, Cavaliere Guido, chemist department agriculture, Italy.....	444-448

S.

1. Sadler, George B., editor Bonfort's Wine and Spirit Circular, New York City	396-398
2. Schiller, Louis J., chemist, Arbuckle Brothers	430, 431
3. Schwarz, Max, director, U. S. Brewers' Academy, New York City	367-374
4. Schweitzer, Paul, professor Missouri State University	348
5. Schöffer, W., flour merchant, Rotterdam, Holland.....	8
6. Scientific American, extracts from	222, 223
7. Scobel, Dr. R. Kennedy, president Health Society, Chicago, Ill	50-52
8. Scully, Maurice H., manufacturer sirups, Chicago, Ill.....	89-96
9. Shand, Arthur T., American agent Arthur Guinness Son & Co., Lim- ited, manufacturers of Guinness' stout, of Dublin, Ireland	543-547
10. Shields, M., confectioner, Chicago, Ill	309-311
11. Silvus, E. G., editor, Athens, Ohio.....	185
12. Smart, Chas., Lieut. Col., Deputy Surg. Gen., U. S. Army	606, 607
13. Smith, Geo. W., flour merchant, Chicago, Ill	133, 134

	Page.
14. Somes, James F., produce dealer, Chicago, Ill	151, 152
15. Sterne, Chas. S., commission merchant, Chicago, Ill	340-344
16. Sterne, Geo. M., commission merchant, Chicago, Ill	220-229
17. Stewart, Greame, druggist, Chicago, Ill	73-79
18. Sternberg, Geo. M., Surg. Gen. U. S. Army, Washington, D. C.	604
19. Stowe, Mrs. N. L., food expert, Chicago, Ill	216, 217
20. Stringfield, C. Pruyne, professor Chicago Baptist Hospital, Chicago, Ill.....	281-283, 548, 549

T.

1. Thomann, Gallus, secretary United States Brewers' Association, New York City, N. Y	351-361, 364, 365
2. Thompson, Charles H., butterine merchant, Hammond, Ind	336-338
3. Thurber, Francis B., president American Grocer Publishing Company, New York City	579-583
4. Tucker, Willis G., Prof. of Chemistry, and director State Board of Health, State New York	433-439, 618

V.

1. Vaughan, Victor C., professor University of Michigan, Ann Arbor, Mich.....	201-207
2. Van Reypen, W. K., Surgeon-General United States Navy, Washington, D. C	615, 616

W.

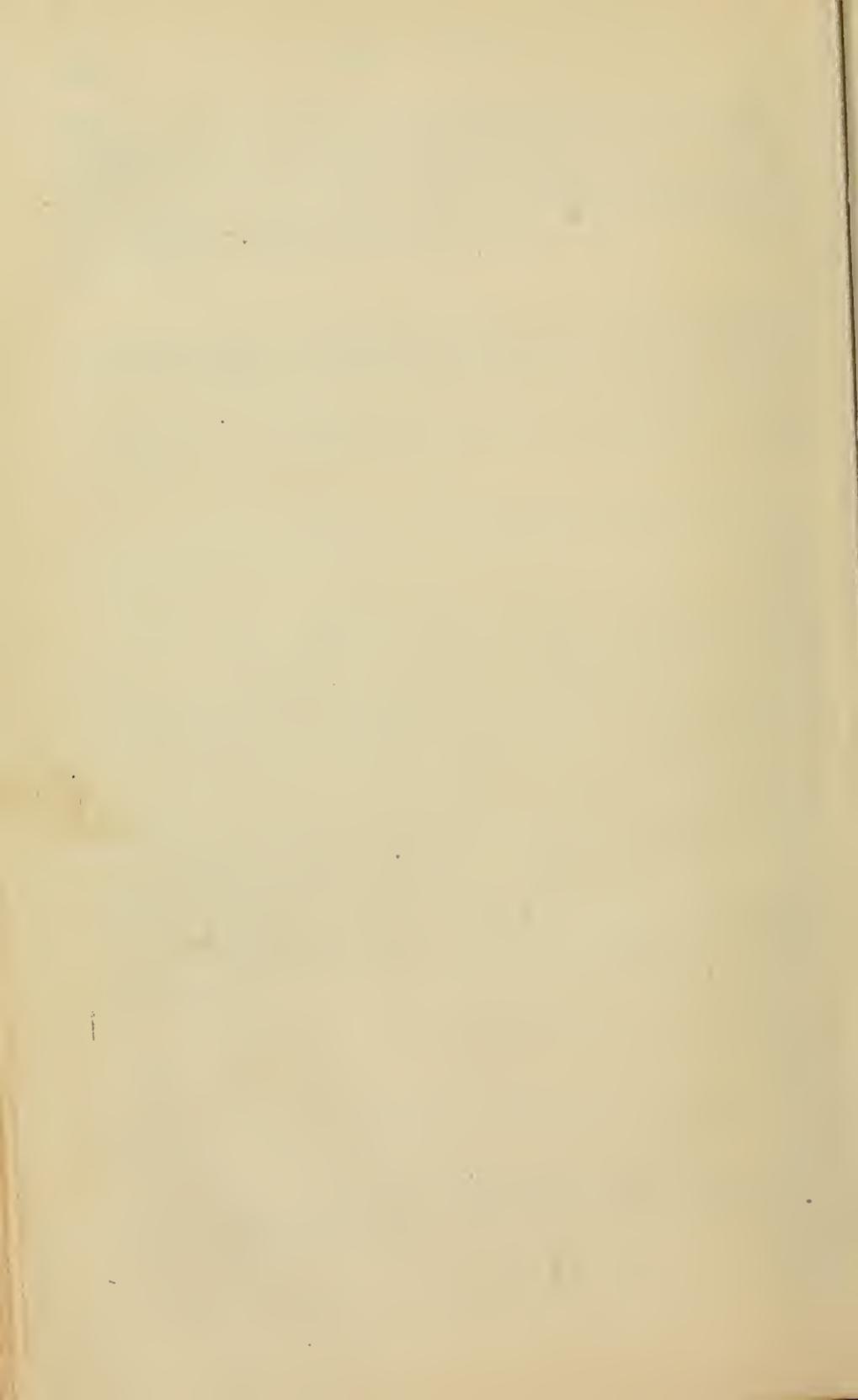
1. Wackenruth, Fred. C., brewer for Ballantine & Co., Newark, N. J	412, 413
2. Wakeman, W. F., appraiser of merchandise, New York City, N. Y	639
3. Wayne, E. S., professor, Cincinnati, Ohio	636
4. Weber, H. A., professor, Ohio State University, Columbus, Ohio	605, 606
5. Werner, Aug. C., jr., manufacturer artificially carbonated champagnes, New York City	576-579
6. Wheeler, Charles G., president White Top Champagne Company, produc- ing American champagne naturally fermented, Pultney, Steuben County, N. Y	521-525
7. Wieting, C. A., commissioner agriculture State of New York, Albany, N. Y	494, 495
8. Wigan, Herbert W., brewmaster for H. Clausen & Co., New York City	374-376
9. Wiley, professor H. W., Chief Chemist, Department Agriculture, United States, Washington, D. C	12-32, 39-47, 52-57, 139, 140, 209-220, 231, 232, 234, 433-439, 582-589, 590
10. Wise, John C., medical inspector U. S. Navy	627
11. Withers, professor W. A., chemist North Carolina Agricultural Experi- ment Station, Raleigh, N. C	617
12. Wyatt, Francis, brewer's chemist, New York City	400-411
13. Wyman, Walter, Surgeon-General United States Marine Hospital, Wash- ington, D. C	616
14. Woodward, Wm. C., Dr., health officer, District of Columbia, Wash- ington, D. C	610, 611

Y.

1. York, George W., editor American Bee Journal, Chicago, Ill	209-216
---	---------

Z.

1. Zeltner, William H., brewer, Zeltner Brewing Company, New York City ..	455-460
2. Zucca, Antonio, president Italian Chamber of Commerce, New York City ..	484-486



INDEX OF SUBJECTS.

A.

Page.

1. Adulterations, general, embracing two hundred and ninety-seven subjects adulterated 33-43, 50, 51, 52, 58-64, 66-73, 79-84, 85-87, 106-133, 135, 136, 137, 187-195, 196-201, 202-207, 220-229, 230-233, 416, 418-426, 433-439, 448-455, 468-473, 474, 475, 480-484, 485, 486, 497-501, 579-583, 584-589
2. Ale and porter 416, 417, 543, 544, 545, 546, 547
3. Allspice 19
4. Alum in baking powders 37, 46, 67, 70, 87, 88, 89, 102-109, 197, 200, 205, 206, 230, 232, 236, 291, 292, 293, 582-589, 590-601, 604-606-621
5. Alum baking powder advocates 531-543
6. Alum in baking powders, prohibition of, advocated by law 27, 106-133, 579-618
7. Alum, prohibited use in foods in England, France, and Germany 597
8. Alum in baking powders, restricted use in Minnesota and Wisconsin 106-133, 597
9. Alum poisonous as an ingredient in foods 549-556, 604-606-621, and supplementary pages.
10. Alum a toxic poison, experiments with 605, 606, and supplementary pages.
11. Alum not found in potable waters, fruits, or natural foods 582-589-601, 604-606
12. Animal fats 13
13. Antiseptics, general, embracing one hundred and sixteen subjects 351-361, 418-426
14. Associated Press statement of Chairman Senator Wm. E. Mason re to committee's work, character of testimony given, and forecast of national food law 500, 501
15. Alum, experiments with, upon dogs, with tables and maps Supplementary pages.
16. Alum, experiments with, upon bladder of freshly killed animals Supplementary pages.

B.

1. Baking powders 37, 46, 47, 67, 68, 69, 70, 71, 87, 102-109, 117, 197, 200, 205, 206, 230, 236, 531-543, 548, 549-556, 557, 558-568, 579-583, 584-589, 590-598, 601, 602-621
2. Baking powders containing alum, experimental tables showing effects upon digestion of the residue left therefrom in bread 557-568
3. Barytes 32
4. Beers, draft and bottled, American 19-21, 49, 50, 187-190, 293-301, 311-313, 351-361-396, 400-413, 415, 416, 486-495
5. Beers, ales, porters, and stouts, imported 290, 291, 351-361, 383, 399, 400, 413, 414, 455-460, 486-493
6. Beers, ales, porters, and stouts, American and imported, analytical tables 639-641
7. Boric acid 13, 255-261, 264-269, 285-290, 418-426
8. Borax as a preservative 13, 15, 16, 15, 16, 47, 48, 242-245, 250-252, 253-261, 261-283, 285-290, 418-426
9. Bran as a residue, usages 22
10. Brandies, American 501-513
11. Brewing beers, ales, porters, and malts 19-21, 49, 50, 187-190, 293-301, 311-313, 351-396, 400-413, 415, 416, 455-460, 486-495
12. Butter, and its adulterants 13, 15, 16, 137-149, 151-155, 157-171, 198, 199, 202, 203, 206-209, 220-229, 230-235, 242-244, 250-252, 265, 266, 313-335, 341-350, 475-480, 495-498
13. Butter preservatives 159-163, 169, 202, 203, 206, 220-235, 313-332
14. Butter, "process" and "renovating" 475-480, 497, 498
15. Butterine, substitute for butter, and laws governing same 137-155, 157-171, 198, 199, 202, 203, 206-209, 220-235, 313-350

C.

	Page.
1. Candies and confectionery.....	30, 31, 70, 302-311
2. Carbonated wines, "champagnes," native and imported.....	569-579
3. Cayenne pepper	19
4. Cereal foods.....	261-264, 362-367
5. Champagnes, American, naturally fermented, in bottles.....	501-513-518-520-525
6. Cheese, "filled"	14, 15, 64, 65
7. Cinnamon	18, 19, 70-73
8. Cloves	19, 71
9. Coffees.....	17, 18, 48, 49, 68, 69, 70, 73-78, 205, 428-431, 499, 500
10. Colorings in foods and liquids	33, 41, 42, 43, 137-146, 189-195, 198, 199, 202, 203, 206-209, 460-465, 498-500
11. Condiments, general	17
12. Copper, salts	42, 43
13. Cordials	427
14. Corn oil	22
15. Cotton-seed oil and stearin	15, 261-264, 362-367
16. Cream of tartar	19, 37, 46, 47, 67, 70, 79, 86, 106-109, 117, 200, 205, 206, 232, 236, 589-598
17. Cream of tartar, high purity of refined product	19, 37, 46, 67-70, 79, 86, 106-109, 117, 200, 205
18. Cream of tartar, product of grapes found in all fruits	582-589, 590-601
19. Cream of tartar substitutes proved by analysis "C. T. S." (cream of tartar substitute) simply alum adulterant	582-589, 590-601
20. Cream of tartar in baking powders	27, 37, 46, 67, 70, 87, 88, 89, 102, 106-133, 109, 197, 200, 205, 206, 230, 232, 236, 239, 291, 292, 293, 549-556, 582-589, 590-601

D.

1. Dairy products	13
2. Distilling wines, brandies, and liquors	52-58, 427
3. Drugs	66-73, 190-195, 433

E.

1. Essences in liquors	52-58, 427, 460-465
2. Extracts, malt	432, 433

F.

1. Fish	40
2. Flour, "mixed" and adulterated	1-15, 26, 27, 58-60
2½. Flour, tremendous increase in sales in Europe, and restored confidence since enactment of pure-flour law	1-11
3. Flourine	21, 137
4. Foods, cereal	58-60
5. Foods, general	433-439
6. Food importations	34, 462-367
7. Fruits, imported	473-475
8. Foods, infants	497
9. Food preservatives	33-34
10. Formaldehyde	13, 171-185, 186
11. Fraudulent adulterations	13
12. Frauds, labeling	40, 41, 467-473, 474, 475
13. Frauds upon revenue by refilling imported bottles and imitating foreign labels	467-475
14. "Freezem"	171-185
15. "Freezene"	149, 171-185
16. Fruits, pickled	25

G.

1. Gas, carbonic acid, native and imported	573-576
2. General frauds	12-43
3. Gelatin	22-23
4. Germ oil	22
5. Ginger	19

	Page.
6. Glucose	19-21, 209-216
7. Government action in re the adoption of pure-food laws and restrictions of adulterations	34-39, 47, 50-52, 58, 59-63, 79, 97, 111, 136, 187, 188, 189, 206, 207, 215, 217, 220, 233, 236, 299, 300, 301, 306, 311-313, 320, 355, 374, 416, 427, 438, 448-455, 459, 460, 467, 470-475, 480, 482, 483, 486, 492-496, 499, 508, 513, 517, 524-531, 548-556, 579-583-589, 601-604, 613-617
8. Grape sugar	20
9. Ground clay	135
10. Gypsum	32

H.

1. Honey	14-16, 209-216, 217-220, 235, 236
2. Hops	19, 20, 21
3. Horse-radish	156, 157

I.

1. Imported foods sold in United States; sale of same prohibited in Eu- rope	52, 53
---	--------

J.

1. Jellies	22, 23, 79, 98, 99, 197, 198, 204
2. Jellies, coloring	101-102, 198, 204

L.

1. Labeling	35, 37-41, 45, 46, 47, 62, 63, 473-475, 547
2. Labels, counterfeiting	396-398, 399, 400, 413, 414, 460-465, 467-475, 547
3. Lard, "mixed"	15, 16
4. Laws, foreign, relating to food products	34, 35
5. Lead poisoning through syphons	238
6. Linseed oil	22
7. Liqueurs, distilling	427, 460-465
8. Liquors, "ageing," "blending," and "coloring"	53-58, 460-465
9. Liquor, sfrauds, etc	53-58, 460-465

M.

1. Malt	19
2. Malt extracts	432, 433
3. Maple sirup	29, 89-97
4. Meats	39, 40, 201, 253-255
5. Milk	13, 64, 65, 439-444, 497, 498
6. Milk, condensed, skimmed, and defective	64, 65, 439-444, 497
7. Mineraline	32, 135
8. Mixed flour	1-11, 133, 135
9. Molasses	29, 89-96
10. Mustard, ground	17, 19, 497

O.

1. Oleomargarine	13-16, 137-149, 151-155, 157-167, 168-171, 198, 199, 202, 203, 206-209, 220-235, 313-325, 326-350
2. Olive oils	16, 484-488, 484-486, 496

P.

1. Pasteurizing process	293-301, 311-313, 351-361, 367-396, 400-413, 426
2. Peppers	18, 19, 497
3. Pickles	155, 156, 157
4. Poisons	420, 421
5. Porter and ale	416, 417, 543-547
6. Preservatives, embracing one hundred and twenty-seven subjects	34, 41-45, 168-170, 187-195, 202-209, 235, 239-242, 266-269, 281-283, 285-290, 418-426
7. Preserves	77-98, 99

	Page.
8. Ptomaine poisoning	284, 285
9. Pure beers	311-313, 351-361, 367-374, 385-396, 455-460
10. Pure-food law, national enactment, advocates of	34-39, 42, 45, 46, 50, 51, 52, 58-63, 79, 97, 111, 187, 188, 189, 206, 207, 215, 217, 220, 233, 236, 299-301, 306, 311-313, 320, 355, 374, 416, 418-426, 427, 432, 438, 448-455, 459, 460, 467, 470-475, 476-480, 482, 483, 486, 492-496, 499, 508, 513, 517, 520, 524, 525-531, 548-556, 579-583, 584-589, 601-604, 613-617
R.	
1. Revenue stamping, foreign method	35
2. Rosaline for coloring	149
S.	
1. Saccharin	53
2. Salicylic acid	47, 48, 281-283
3. Sirups	28, 89-97, 238, 239, 498
4. Spices	17, 18, 19, 66-73, 156, 157
5. Starch	21
6. Stout, imported	543-547
7. Sugars	30, 428-431, 465-467
8. Sugars, maple	29, 237
9. Sirups, soda-water	498
T.	
1. Tea	498, 499
2. Tea, "facing" and weighting	499
3. Terra alba	31, 32
V.	
1. Vinegars	24, 25, 233, 234
W.	
1. Waters, mineral and carbonated	238, 432, 433
2. Wines	40, 41
3. Wines, "blending," "ageing," "coloring," frauds, etc	53-58
4. Wines, champagnes, American, pure, naturally fermented	501-508, 508-513, 513-518, 518-520, 521-525, 598-601
5. Wines, champagnes, artificially carbonated	569-579
6. Wines, American champagnes, pure American champagnes carbonated, and imported champagnes. Result of test and analyses made by Prof. H. W. Wiley, Chief Chemist Department Agriculture United States, and by Duncan B. Harrison, Sergeant-at-Arms of Committee—Supplementary pages	501-508, 508-513, 513-518, 518-520, 521-525
7. Wines, still American	501-508, 508-513, 513-518, 518-520, 521-525
8. Wines, Italian	441-448
9. Wines, champagnes, French	598-601
Z.	
1. Zinc salts	42

RECAPITULATION.

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WILLIAM A. HARRIS, of Kansas.
ALEXANDER S. CLAY, of Georgia.
JOHN L. McLaurin, of South Carolina.

MAKING CERTAIN INVESTIGATIONS, UNDER AUTHORITY OF SENATE RESOLUTION 447, AND RESOLUTION OF MARCH 3, 1899.

Number of sittings held	37
Number of days of sittings	51
Cities in which testimonies were taken	3
New York City, N. Y.; Chicago, Ill.; Washington, D. C.	
Number of subjects and adulterations examined	677
States visited by committee's representative for purpose of inspection of manufac-	
tories, purchase of samples of foods in open market for chemical	
analysis	7
Illinois, Maryland, Missouri, New Jersey, New York, Pennsylvania,	
Wisconsin.	
Number of cities visited by committee's representative for purpose of inspection	
of manufacories and purchase of samples of foods in open market for chem-	
ical analysis	19
Illinois	1
Chicago	
Maryland	1
Baltimore	
Missouri	1
St. Louis	
New Jersey	3
Hoboken, Jersey City, Newark	
New York	9
Albany, Brooklyn, Buffalo, Hudson, New York City, Rochester,	
Syracuse, Staten Island, Troy	
Pennsylvania	3
Philadelphia, Pittsburg, Scranton	
Wisconsin	1
Milwaukee	
Number of manufacories, warehouses, markets, stores, breweries, and distil-	
leries visited by committee's representative	241
Manufactories	39
Warehouses	11
Markets	12
Stores	81
Breweries	92
Distilleries	6

Number of samples of foods purchased by committee's representative in open market and turned over to the Department of Agriculture for analysis by Chief Chemist H. W. Wiley and assistants	438
Consisting of—	
Ales, American and imported.	
Baking powders (tartaric acid and alum).	
Beers, American and imported.	
Canned fish.	
Canned meats.	
Catsups, American and imported.	
Champagnes, American and imported and carbonated.	
Coffees.	
Condiments, American and imported.	
Confectionery.	
Cream of tartars.	
Cream-of-tartar substitutes (C. T. S. or alum).	
Extracts.	
Glucose.	
Honey.	
Jellies.	
Maple sirups and sugars.	
Molasses.	
Patés.	
Pickles.	
Porters.	
Preserves.	
Sauces.	
Sirups.	
Spices.	
Sugars.	
Teas.	
Wines, American and imported.	
Number of witnesses examined.....	196
Classified as follows:	
Appraisers of customs	2
Beehivers	1
Brewers	11
Brew masters	4
Bottlers	2
Carbonated wine producers	2
Champagne producers	5
Chemists	3
Chief chemists	1
Commissioners of States	1
Commissioners and chemists State departments of agriculture	5
Commission merchants	2
Distillers	1
Druggists	2
Editors	9
Experts on food products	6
Health officers	4
Importers	4
Liquor dealers	2
Manufacturers	26
Merchants	7
Millers	3
Physicians	8
Presidents of companies	12
Presidents of associations	2
Produce dealers	1
Professors and analytical chemists	21
Professors of colleges, institutions, hospitals, and universities	20
Professors of United States Government departments	4
Professors of State government departments	2
Refiners	2
Revenue agents	1
Salesmen	3

Number of witnesses examined—Continued.

Classified as follows—Continued.

Secretaries of companies and associations	5
Specialists on food products	1
Surgeons	2
Surgeon-General of Army and assistants	2
Surgeons of Army	1
Surgeon-General of Navy	1
Surgeons of Navy	3
Surgeon-General of Marine Corps	1
Surgeons of Marine Corps	1
Foreign communications and reports	43
Agents	2
Brewers	2
Chemists	2
Merchants	34
Professors	2
Presidents of chambers of commerce	1
Total number of pages of testimony taken	641

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